JULY 21, 1958

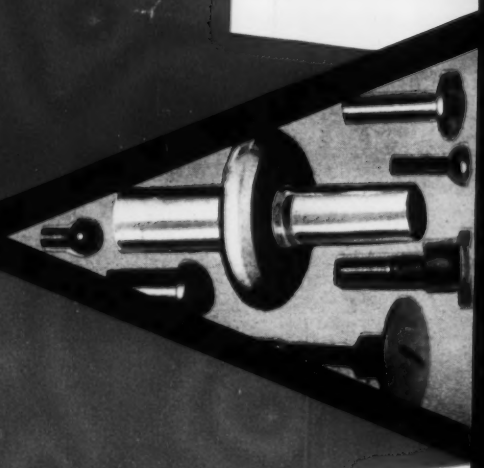
STEEL

The Metalworking Weekly

A PENTON PUBLICATION

WARM HEADING...

It may solve your tough-metal forming problems on parts like these . . . Page 114



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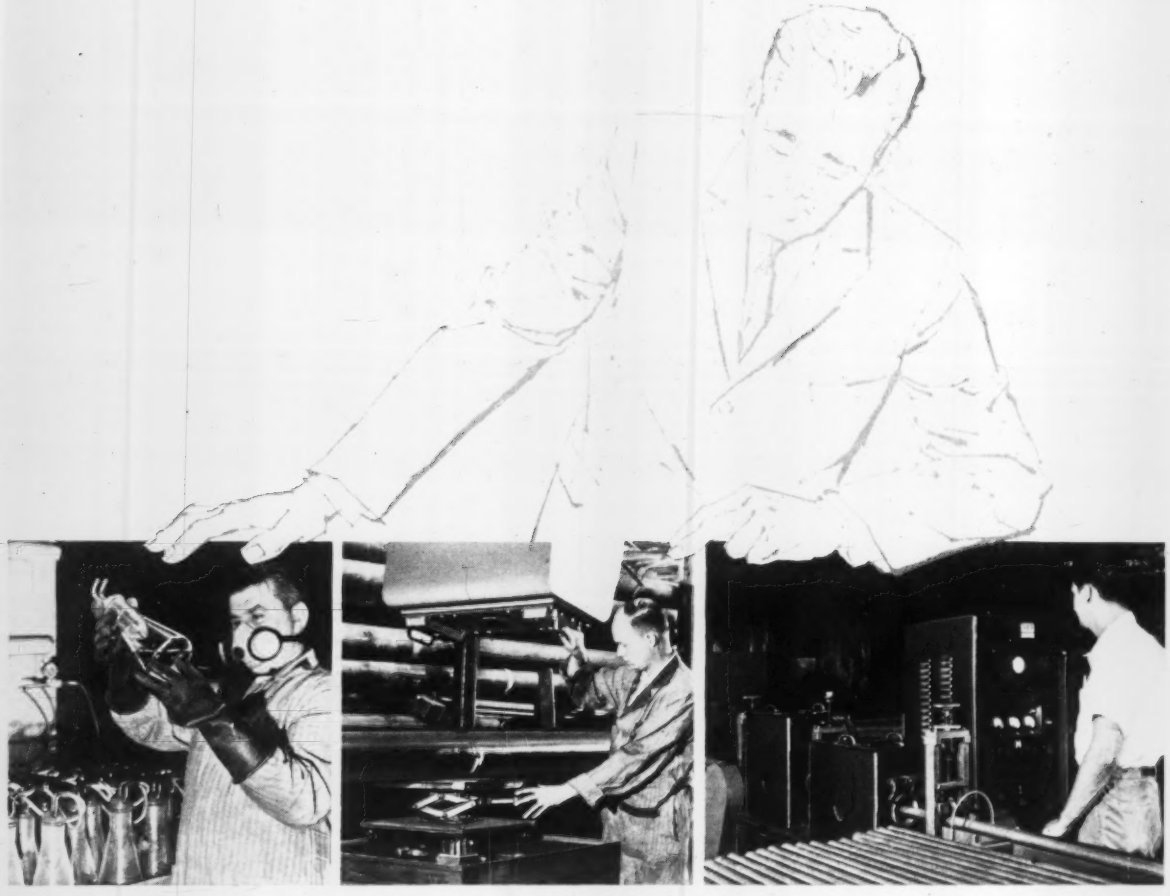


B&W Quality-Controlled Tubing

is matched to the application

From raw materials to finished tube, quality depends upon control and "know-how." And when it comes to matching the one right tube, of the hundreds of possibilities, for a particular end use application, it takes specialized equipment and experienced technicians.

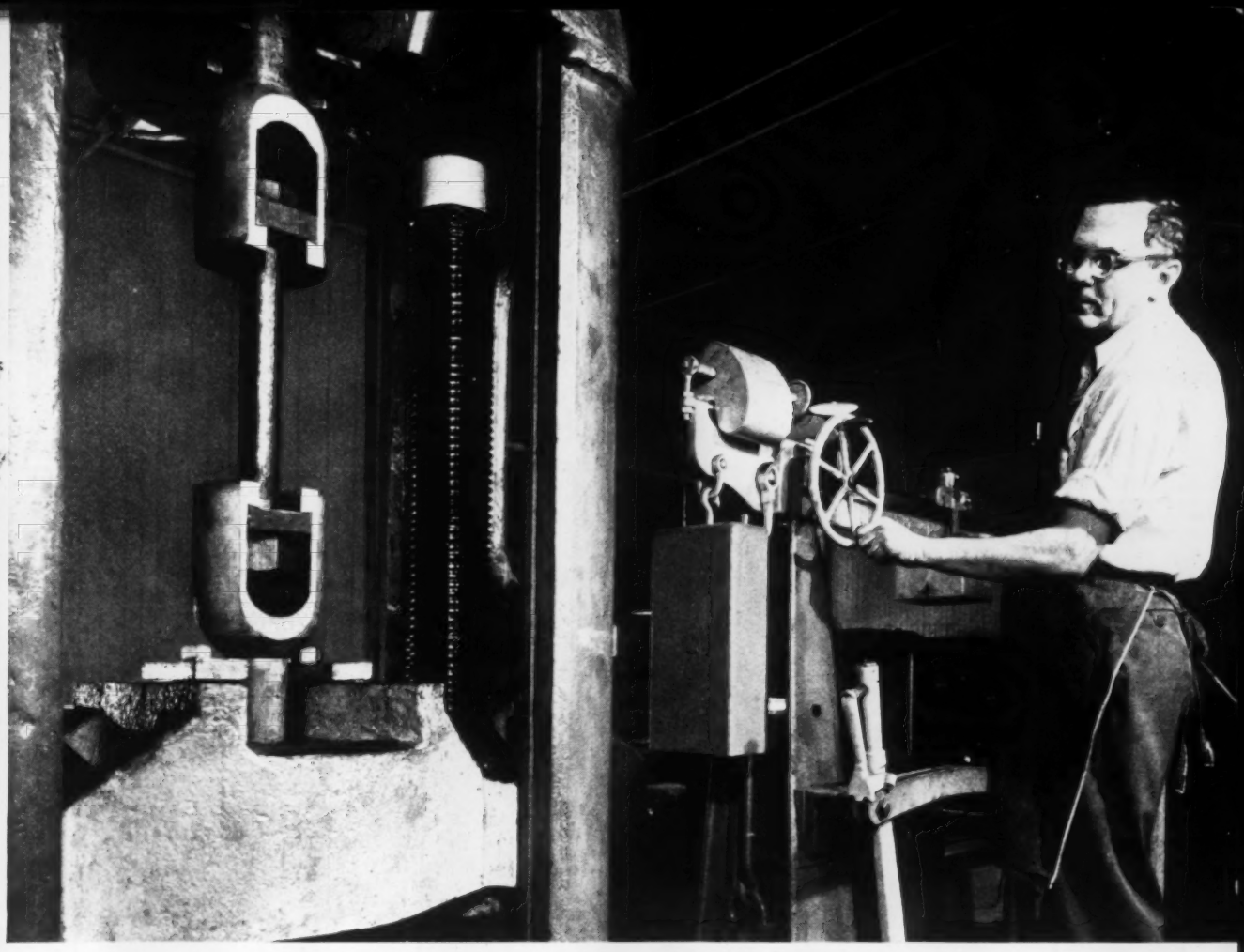
For instance: If corrosion is a problem — will a steel with a particular heat treatment do the job? If the tube is unusually long and center welding is employed to achieve length — is the joint completely satisfactory? If the tube must have a special soundness quality — is it free from hidden or invisible defects?

These are but a few of the quality control checks which insure that the tubes you buy from B&W are as near perfect in terms of performance as it is possible to make them. When you need stainless, carbon or high alloy tubing — for pressure or mechanical applications — you can rely on Mr. Tubes and B&W to supply the best. Write for bulletin TB-420 — The B&W Quality Control Story. The Babcock & Wilcox Co., Tubular Products Division, Beaver Falls, Pa.

B&W
TUBULAR PRODUCTS DIVISION

TA-8030-G3

Seamless and welded tubular products, solid extrusions, seamless welding fittings and forged steel flanges —in carbon, alloy and stainless steels and special metals.



In this tensile testing machine, Bethlehem High-Strength Structural Bolts are tested full size in commonly used diameters. We can test bolts as large as 2 ½ in. diameter, such as the one shown.

We test high-strength bolts at full size to determine their strength on the job

There's no guesswork about performance when you use Bethlehem High-Strength Structural Bolts. The strength of these heat-treated carbon steel bolts is controlled by periodic tests made on full-size bolts in the sizes commonly used in bridge and building construction.

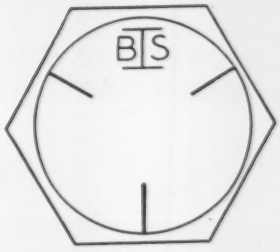
All heat-treatment lots of Bethlehem High-Strength Bolts are tested in accordance with the requirements of ASTM Spec. A-325-55T, which covers all sizes of bolts for numerous applications. Because of the full-size testing, used in preference to standard test bars or turned specimens, any non-uniformities in the bolts, either in structure or tensile properties, can be fully evaluated.

If you would like to have more information about the manufacture, testing, or installation of high-strength structural bolts, simply write the Bethlehem sales office nearest you.

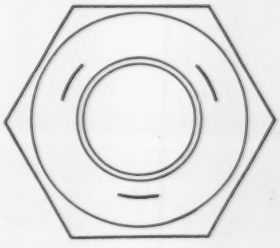
BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation
Export Distributor: Bethlehem Steel Export Corporation

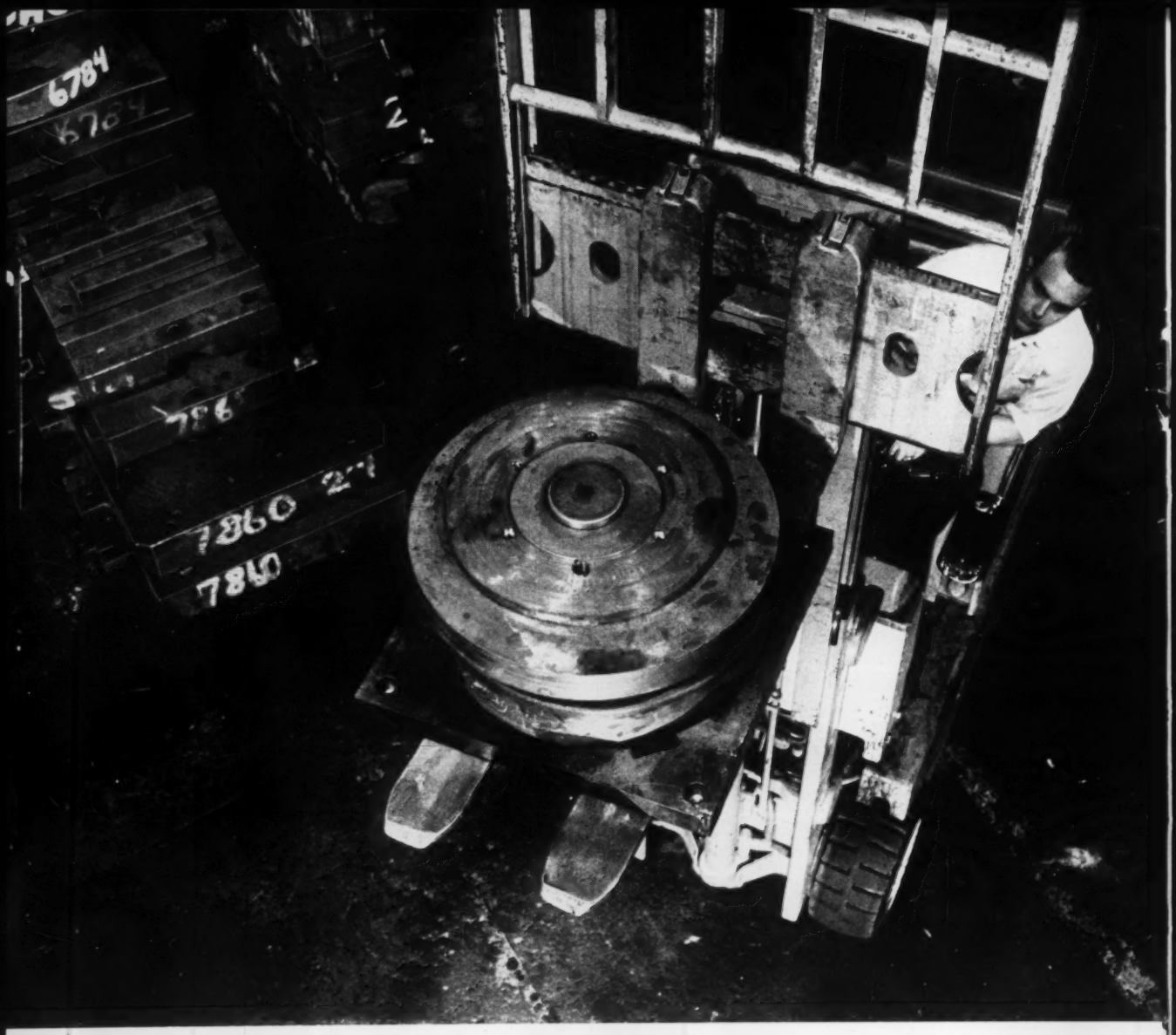
BETHLEHEM STEEL



Bethlehem High-Strength Bolts are identified by trademark, plus three raised radial lines, on bolt head.



Typical American Standard Heavy Semifinished Nut used with high-strength bolt. It meets ASTM Specification A-325, and is identified by three depressed arcs in the crown.



His trip to the "bank" just saved someone $15,000

This die being "withdrawn" from COMMERCIAL'S "die bank" of more than 20,000 available die components will save someone the cost of completely new dies—will mean that a COMMERCIAL stamping customer will be able to get custom produced parts at a substantial saving in tooling expense.

Every day units from our extensive "die bank" are being utilized to produce an infinite variety of stamped component shapes for many industries. Very often these existing die components are combined with partial new tooling to produce custom stampings to meet the most specialized requirements.

Our engineers working closely with a customer are frequently able to suggest design modifications which make possible even greater customer saving through the most advantageous use of die components already in COMMERCIAL'S "die bank". Thus, many times stampings are made available free of tool or die charges.

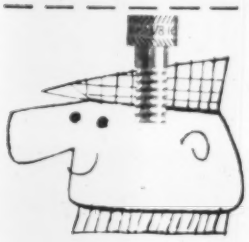
Modern press equipment—100-ton to 2000-ton capacity—bangs out more hits per hour and contributes to lower unit cost for medium to heavy stampings. And, over 30 years of experience in the forming of metals has developed the skill which makes the toughest of stamping jobs look easy.

Just a blueprint, sketch or prototype of your part in the hands of our engineers could be the key to important savings on your very next job. Address Commercial Shearing & Stamping Company, Dept. L-30, Youngstown 1, Ohio.

Specialists in the shape of things to come

CUSTOM STAMPING • UPSET FORGING • ROTOFORMING

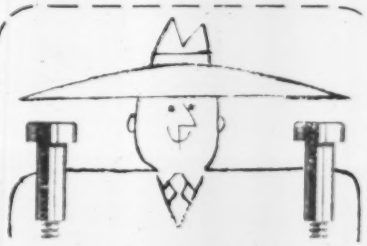
COMMERCIAL
shearing & stamping



CAP SCREWS

keep your cap on tight.

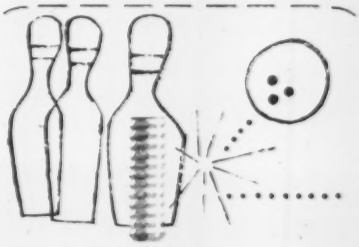
Owners of Thunderbirds, Corvettes and other snazzy top-down convertibles, tell us our special alloy and stainless steel P-K SOCKET HEAD CAP SCREWS do a mighty fine job of keeping their caps on. Naturally they specify PARKER-KALON, because they know P-Ks are instrument tested and inspected at every step of manufacture.



SHOULDER SCREWS

keep shoulders from sagging.

Used on either shoulder, or preferably both, P-K SHOULDER SCREWS will make you stand straighter, look better, may even result in getting you a substantial raise. Dependable, too. Heads are concentric with body for uniform, accurate assembly. Finished threads are close to shoulder for maximum holding power. And P-K SHOULDER SCREWS are accurate for positive internal wrenching and non-slip drive.



SET SCREWS

help make your score look good.

When the pin boy sets the pins for your opponent, he inserts a P-K SOCKET SET SCREW. Nobody'll know what's happening. Even a perfectly placed ball won't budge the pins as those P-K Set Screws hold them firmly to the floor. Same fine job in your plant, too. Use a P-K Cup Point for collars on pulleys and shafts, P-K Flat Point against hardened steel, and there's a selection of P-K Oval, Cone and Half-Dog Points from which to choose.

BUTTON HEADS

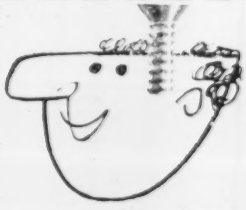
for you know who . . .

Take that neighbor who borrows your tools and never returns them. You can't openly call him names—his wife and yours are PTA buddies. So, just place a few Button Heads around his doorstep. He'll get the idea. And don't forget, you can also use P-K BUTTON HEAD CAP SCREWS for attaching cover plates and guards to production equipment and machine tools where countersinking isn't practical.

guide to

P-K®

SOCKET SCREWS



FLAT HEADS

for that well-groomed look.

Holes in the head are apt to cause talk. Especially where the top of the noggin tends to be flat and somewhat bald. Users can remove hats without embarrassment. P-K FLAT HEAD SOCKET CAP SCREWS are flush when countersunk, leaving smooth surfaces unmarred by burred slots. Use for fastening thin strips, moldings, plates and sheet metal where maximum head contact is required.

HEX KEYS

for putting a hex on people.

Persons planning the quiet disappearance of friends or neighbors, or merely interested in more productive shop practices, should always remember to specify P-K ENGINEERED HEX KEYS. They're heat treated under laboratory supervision to assure maximum resistance to torque stresses and freedom from brittleness. And come in handy for tightening those mighty fine socket screws offered by Parker-Kalon.

Like a copy of this guide for your office? We'll be glad to send a reprint suitable for framing.

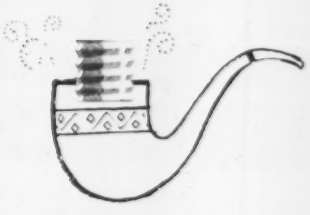
PARKER-KALON®

SOCKET SCREWS

Sold only through industrial supply distributors

PARKER-KALON DIVISION, General American Transportation Corporation, Clifton, N. J.

Originators of the Self-tapping Screw; Manufacturers of Screw Nails, Masonry Nails, Wing Nuts, Thumb Screws and the new Rimguard Weld Screws.

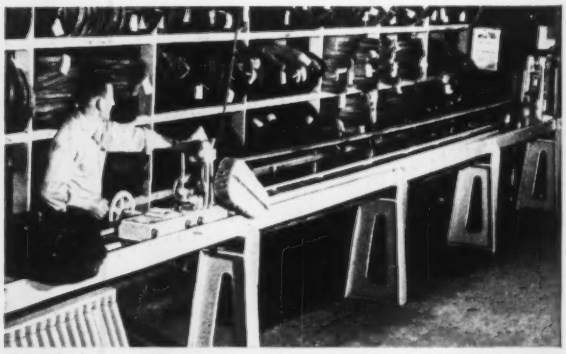


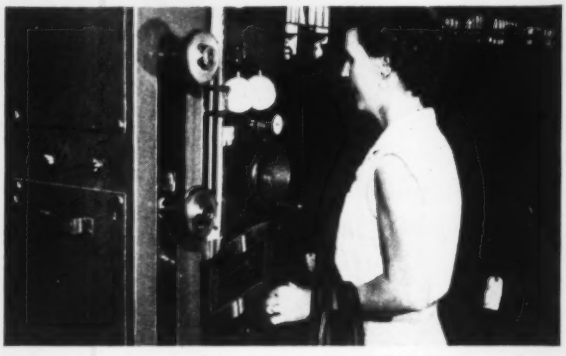
PIPE PLUGS

. . . just dandy for that old pipe.

P-K SOCKET PIPE PLUGS are the perfect answer whenever smoke gets kinda thick in the house and the little woman starts to get that look on her face. Drive one firmly into the bowl of your favorite pipe. No smoke escapes and all is peaceful. Examine a P-K Pipe Plug. Controlled chamfer makes for fast starting of threads. And P-Ks *Dryseal* produces a positive sealing without the necessity of a compound.

Only V-Belts with the Green Seal give you





Precise measurement of every Goodyear V-Belt and coding to unusually fine tolerances prepare the way for more exact matching of sets—at factory, warehouse, or by distributors. The built-in quality of Dimensional Stability assures that belts stay matched, for life.

dimensional stability – Unsurpassed steel cables or exclusive Triple-Tempered (3-T) Cords provide true dimensional stability from factory to drive.

– that assures you of –

matched sets that stay matched – Sets of belts are matched to the closest standards. And they stay matched under all conditions of storage.

minimum stretch on the drives – Belts on multiple drives work as a team. You eliminate "loafers" – or overworking any of the belts.

– and you also get –

high modulus – You get the greatest possible resistance to shock-loads. You're protected from power loss due to "creep."

friction balance – Covers have the ideal coefficient of friction. No sticking or grabbing in the grooves. And no dusting.

mildew immunity – You're safe from the effects of moisture – in use or in storage. Stand-by belts are always ready for use – no matter how long you keep them.

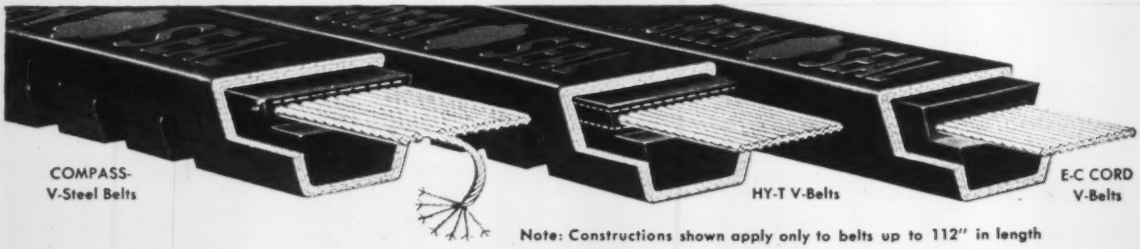
– and all that pays off in –

–maximum, trouble-free horsepower hours–at minimum cost – on any and every drive in your plant. It's easy to see why you should see your Goodyear Distributor for details. Or write to Goodyear, Industrial Products Division, Lincoln 2, Nebraska, or Akron 16, Ohio.

DIMENSIONALLY STABLE V-BELTS with the GREEN SEAL by

GOODYEAR

THE GREATEST NAME IN RUBBER



Note: Constructions shown apply only to belts up to 112" in length

Watch "Goodyear Theater" on TV—every other Monday, 9:30 P. M., E. D. T.

Compass, E-C Cord, Hy-T, Green Seal–T. M.'s The Goodyear Tire & Rubber Company, Akron, Ohio

This Week in STEEL The Metalworking Weekly

July 21, 1958
Vol. 143 No. 3

EDITORIAL 69

Russia is using price fighting tactics to open up new economic fronts in the Free World market place.

SPECIAL FEATURE 114

WARM HEADING

Here's a process that has an impressive potential. Warm (200 to about 1000° F) heading appears to be destined for a limited role, that of a problem solver for tough metals.

WINDOWS OF WASHINGTON 78

Rapid development of our 49th state, Alaska, is assured if federal and local agencies push for quick action.

MIRRORS OF MOTORDOM 85

If you want to sell to GM and don't know where to go, write to Ray Vogel, Procurement & Scheduling Div. He'll relay your letter to right party.

THE BUSINESS TREND 89

Industrial production expected to ride out rest of summer a little above mid-point between this year's high and low on STEEL's index.

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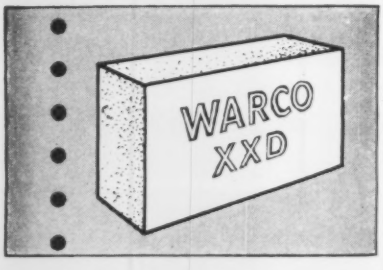
STEEL, the metalworking weekly, is selectively distributed without charge to qualified management personnel with administrative, production, engineering, or purchasing functions in U. S. metalworking plants employing 20 or more. Those unable to qualify, or those wishing home delivered copies, may purchase copies at these rates: U. S. and possessions and Canada, $10 a year; all other countries, $20 a year; single copies, 50 cents. Metalworking Yearbook issue, $2. Published every Monday and copyright 1958 by Penton Publishing Co., Penton Bldg., Cleveland 13, Ohio. Accepted as controlled circulation publication at Cleveland, Ohio.

Index available semiannually. STEEL is also indexed by Engineering Index, 29 W. 39th St., New York 18, N. Y.

TARGET FOR TODAY

Today, the choice of the right refractory is more important than ever before. That means choosing a refractory with a combination of physical characteristics such as Warco XXD. With lower porosity and higher bulk density, Warco XXD, High Duty Fire Brick, is noted for unusual resistance to thermal shock. Especially recommended for checker brick work in open hearths, hot blast stoves and for use in soaking pit coping tile, Warco XXD is the last word in physical properties that assure greater value per dollar invested.

Dry press process. In standard sizes and many special shapes. Write for details.



Specialists in Refractories of High Bulk Density and Low Porosity.

WALSH REFRACTORIES CORPORATION

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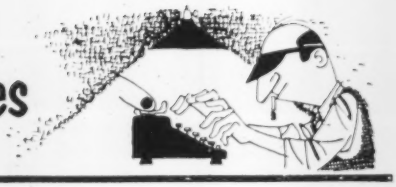
FOR OVER 60 YEARS MANUFACTURERS OF HIGH GRADE REFRACTORIES

behind the scenes



We Goofed Again

Once upon a time when the world was enveloped by terror, and the massive forces of evil were pressing against the flanks of our beloved Republic, it came to pass that ol' Shrdlu was enveloped in the uniform of a private, trained at public expense, and instructed to go forth and strike counterterror to the heart of the Axis Powers. One morning, in the discharge of these stern instructions, we found ourselves part of a latrine detail, digging trenches in the sand by the shores of the sounding sea. One of our fellow warriors had captured a land crab, about the size of a soup plate, and we all stopped to admire it.

"There's something about the repulsive and idiotic expression of this beast," we remarked to an appreciative audience, "that reminds us of the poor little sawed-off, baby-faced, pink-gummed, half-witted, juvenile degenerate who acts as our lieutenant."

"Would you mind repeating that, soldier?" came the clear young tones of an officer and a gentleman. "Can you explain why you are stalling, inciting insurrection, and showing disrespect for an officer?"

The only possible answer—and the one that serves in civilian as well as in military life—was, "No excuse, sir!"

Two weeks ago, we directed your attention to an article on Russia by Editor-in-Chief Irwin Such. "Turn to Page 40," we wrote airily. Well, picture 75,000 readers turning at once to Page 40; why, the whispering thunder of all those pages flipping under carefully manicured thumbs would have made a noise like a tidal wave. So what happened when Page 40 was exposed to STEEL'S readers? There was no sign of Irwin, or Russia, either. By way of explanation, we can say that the assembly of a weekly magazine is a tricky and exacting operation; that slips are always possible; that the best possible answer is an honest red face and a "No excuse, sir!"

A Bitter Note

However, nobody in this business can bat a thousand, as a gimlet-eyed reader from Seattle can testify. In the June 23 STEEL, an item headed "Duplicating Space Projects Set" carried a mention of Boeing and Martin, competing missile-aircraft manufacturers, and the contracts they had received to develop an advanced version of North American's X-15 project. The new project will be termed Dyna-Soar, but three times STEEL spelled it "Dyna-Sour."

No excuse, sir!

Thanking the Nice Gentleman

Chicago Editor Bill Dean has reason to feel confused. He is a young man, of average height and weight, and looks just like any other young man who has washed, combed, shaved, dressed, and brushed himself. Wherefore, when he boarded a plane bound for Cleveland recently, and a lady with a little girl accosted him, he thought nothing of it. He knew he didn't resemble Gargantua, or Jack the Ripper, or a zoot-suiter from Olivera Street, so he smiled easily, showing his Gleem-brushed teeth (only had time to brush 'em once that day, you know) and said "Hello!" or something equally relaxed.

The lady explained that the little girl was nine years old, and would be permitted to travel at reduced rates if accompanied by an adult. Would the gentleman sit with her—the child, that is—on the flight to Cleveland, and so save them—Well, what would you do? That's exactly what Bill did. He said the kid whipped out a set of comic books, and settled down like a veteran of the airways. She was no trouble at all.

When the plane landed in Cleveland, Bill stayed with her until she sighted some of her relatives. As they came to pick her up, he heard her say, "We couldn't find a nice old lady this time, so I got stuck with that old square!"

Soft Job

On the back page of July's *Better Castings*, house organ of Continental Copper & Steel Industries Inc., appears the following:

"As everybody knows, an executive has practically nothing to do—except decide what has to be done—tell someone to do it—listen to reasons why it shouldn't be done—why it should be done by somebody else—to follow up to see if the thing has been done—to discover it has not been done—to listen to excuses from the person who should have done it—to discover it finally has been done, but incorrectly—to point out how it should have been done—to conclude that, as long as it has been done, it might as well be left the way it is—to consider how much simpler it would have been if he had done it himself—to discover it took two days to find out why it took someone three weeks to do it wrong.

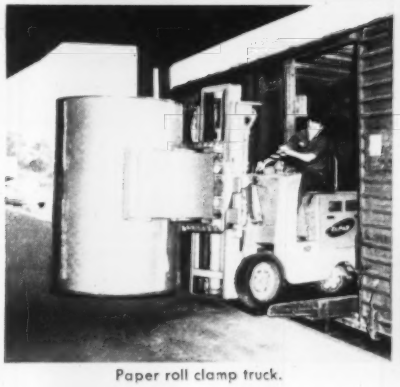
Executives have nothing to do.

Shrdlu

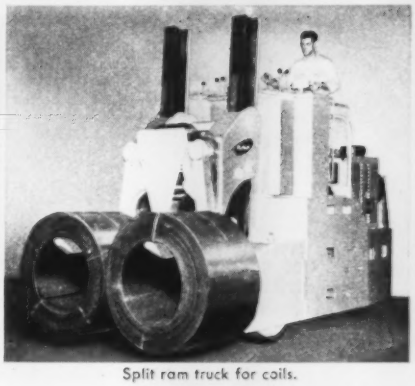
(Metalworking Outlook—Page 65)

ELPAR®

ELECTRIC TRUCKS...



Paper roll clamp truck.



Split ram truck for coils.

NEW ELPAR electric cotton truck.

Designed to Tame Your Tough Handling Jobs

Put ELPAR trucks with attachments to work and keep your "hard-to-handle" materials flowing smoothly. There are ELPAR attachments for virtually every type of out-of-the-ordinary load. Most are readily interchangeable with forks to provide truly versatile performance.

ELPAR attachments need not be costly. In your case, all that may be required is some minor modification to the standard truck—yet the result could well be a major increase in handling efficiency.

Call in your local ELPAR man. A materials handling expert, he'll help you in proper truck-to-job application. And he'll explain to you why traditional ELPAR electric truck dependability is your assurance of *twice* as many years of dependable service as other power-types—with only *one-third* the operating and maintenance costs.

NEW LITERATURE
Send for New Attachments Brochure and "Gas vs. Electric Truck" Folder.

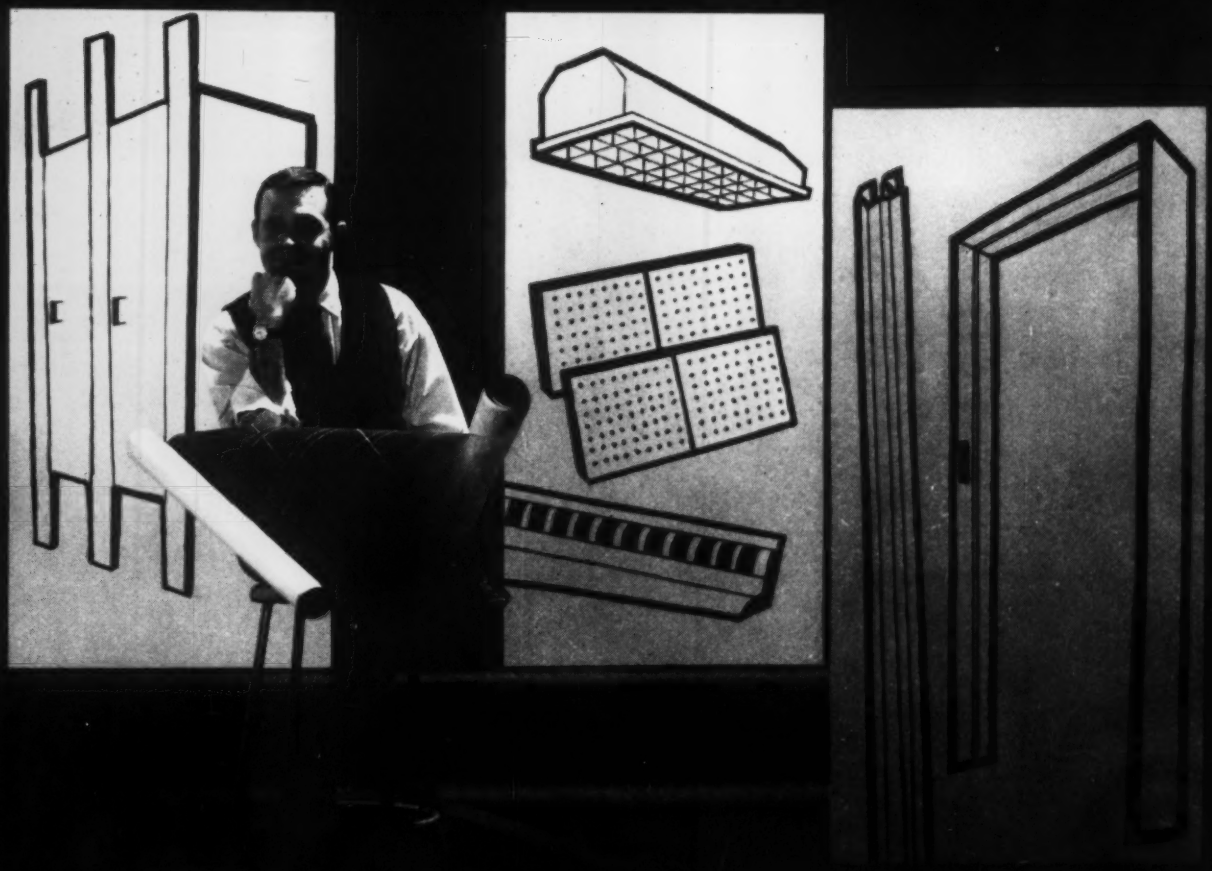
ELPAR®

ELECTRIC TRUCKS

THE ELWELL-PARKER ELECTRIC COMPANY

4104 St. Clair Avenue • Cleveland 3, Ohio

Twice the Life...1/3rd the Operating Costs



HOW ZINC-COATED STEEL SHEETS
KEEP PRODUCTS–AND MANUFACTURERS–LOOKING YOUNG

Today, it's almost axiomatic that the more zinc-coated steel you put to work for you, the more freedom your products will have from corrosion—and the more freedom you'll have from customer kicks about corrosion and corrosion-caused maintenance costs.

That's why it pays to use zinc-coated steel sheets in the products you manufacture (such as light troffers, metal ceiling tiles, baseboard heating panels, sliding door hardware, etc.).

Look at the formability, for example. With either electrolytically zinc-coated steel sheets, or continuous process zinc-coated sheets, the tight coating stays tight through the severest fabrication operations. How about corrosion prevention? It's long-lived, uniform, relentless. First cost is low. Maintenance costs are nil. And the results are a lasting credit to your product and your reputation. How about paintability? Electrolytic zinc-coated steel surfaces, chemically treated, are unexcelled for painted products. It lets paint dig in and hold its unbroken smoothness and beauty for keeps.

In electrolytically zinc-coated steel, the name that stands for bonus performance is Weirzin. In continuous process zinc-coated sheets, it's Weirkote. Let us show you how Weirzin or Weirkote will keep your products—and you—looking young.

Write for informative brochure on each today. Weirton Steel Company, Dept. H-24, Weirton, West Virginia.

WEIRTON STEEL COMPANY

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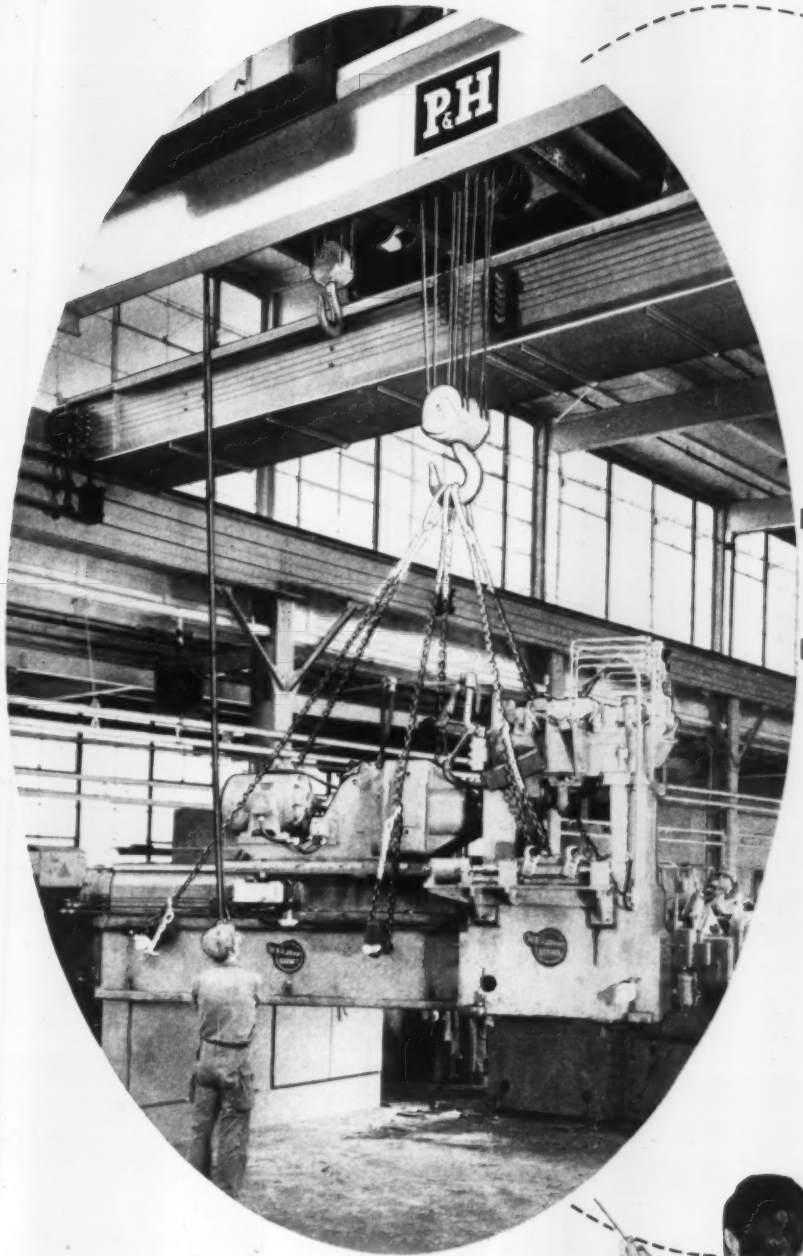

find out about the low price of

P&H trav-lift

before buying your next crane!

Only P&H Trav-Lift® offers all these features in the 1 to 20 ton crane class:

- P&H one-source responsibility
- Electrical equipment designed specifically for crane service
- Maintenance-saving mill-type rectifier brakes
- Either cab or floor operated — or both!
- All-welded steel construction
- Bridge engineered for vertical strength and lateral stability
- Heat treated gearing throughout
- Forged steel wheels

Compare first — then specify! Dept. 123E, Harnischfeger Corp., Milwaukee 46, Wisconsin.

You can buy the Trav-Lift crane — packed with big-crane features — for far **less money than you think!**

HARNISCHFEGER P&H ... quality and service for 74 years

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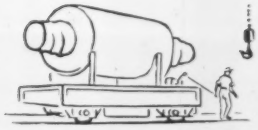
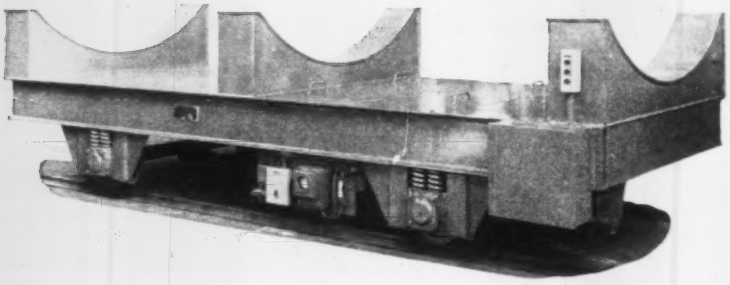


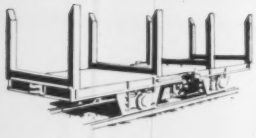
for added efficiency . . .

extra economy



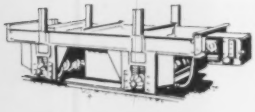
ATLAS WALK-ALONG

SAFETY-TYPE TRANSFERS



Special bed designs to cradle your load.

Single platform or double platform-operator rides.



Versatile power . . . diesel or gas electric, storage battery, or cable reel. Also remote control with no trailing cable.

If you're responsible for maintaining safe, low cost movement of heavy loads (5 to 125 tons) and intermediate transfer of these loads during process or storage, Atlas can help you by engineering a transfer car to meet your exact load and power requirements.

Atlas engineering gives you every modern safety feature for personnel protection.

. . . choice of power and control including:

1. Single lever (walk-along) forward, reverse with safety stop when lever is released.
2. Storage battery power with built-in charger.

For Cost-Saving Details Request "Walk Along" Bulletin 1286

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ENGINEERS & MANUFACTURERS SINCE 1896

LETTERS TO THE EDITORS

Wants Replacement Formula

Please send two copies of the article which appeared in STEEL, June 20, 1955, p. 99, based on the Machinery & Allied Products Institute's formula for machinery replacement, developed in "Dynamic Equipment Policy" by George Terborgh.

As mentioned in the article, "Price of Not Re-equipping" (June 23, Page 51), this work has been brought up to date and we understand copies are now available.

C. F. Fritch Jr.
Plant Manager
National Cylinder Gas Div.
Chemetron Corp.
Chicago

• *"Dynamic Equipment Policy" is a book. The revised edition is for sale by Machinery & Allied Products Institute, 1200 18th St. N.W., Washington 6, D. C.*

Requests Reprints for Salesmen

Please send a copy of "Price of Not Re-Equipping" (June 23, Page 51). We would appreciate permission to reproduce this article for distribution among our sales and service personnel.

Noel L. Cooperider
Service Manager
Dry Cleaners' Equipment
Butler Mfg. Co.
Kansas City, Mo.

• • •

Will you send us a copy of this interesting article?

John Zakanycz
Manufacturing Staff
Worthington Corp.
Harrison, N. J.

Ways To Move Furnace Parts

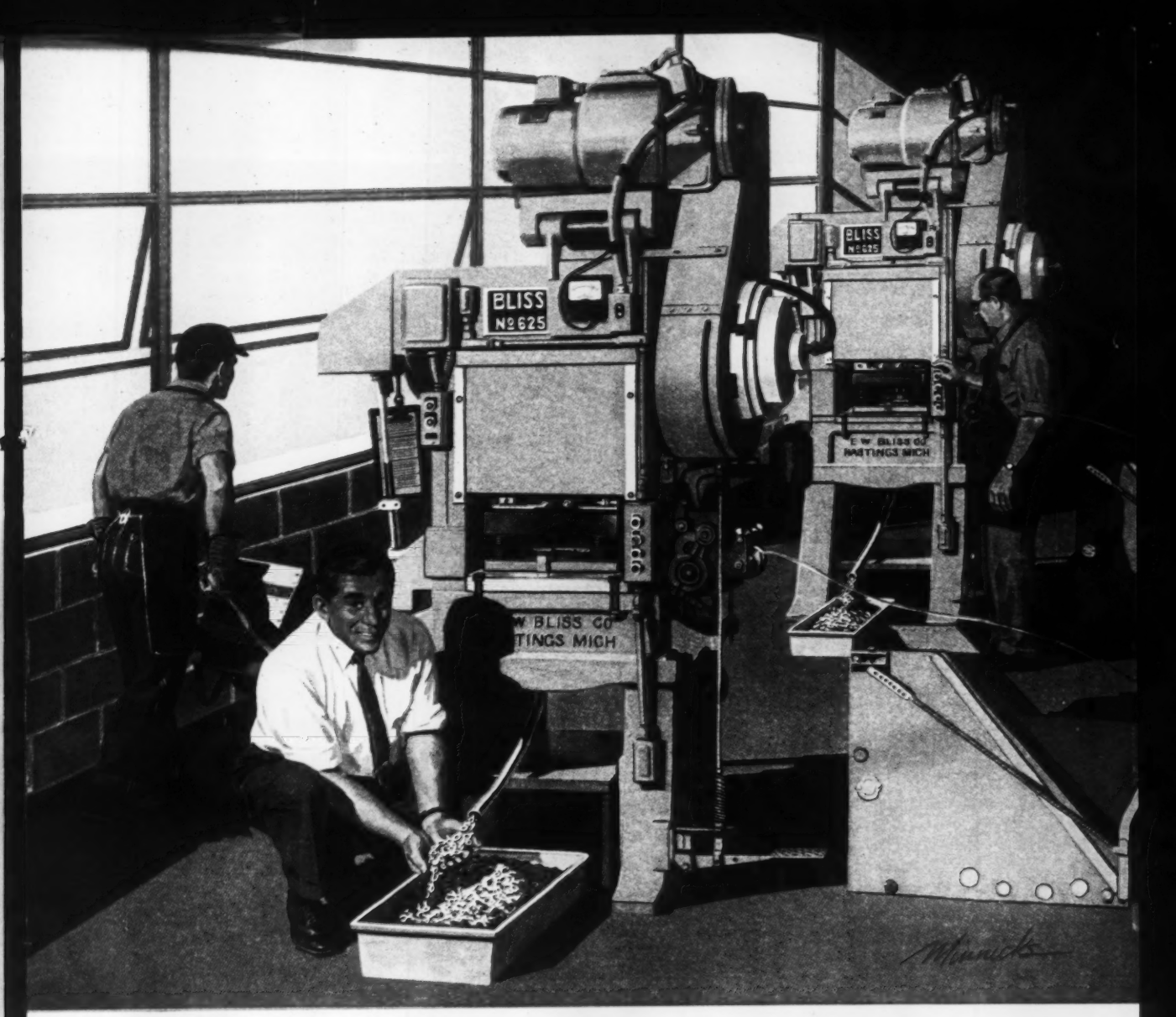
We have received your magazine for many years and we would appreciate a few copies of your interesting article, "18 Ways to Move Parts in a Furnace" (June 23, Page 90).

M. Dellagatta
American Saar Steel Corp.
New York

Seeks Missile Contractor Guide

In your Metalworking Outlook item, "Missile Subcontracting Notes" (June 23,

(Please turn to Page 12)



"I get 1200 parts a minute from each of these presses...

...all day long!" And production like that continues day in, day out. For Bliss High Production presses are especially designed for continuous high speed operation. Counterbalanced shaft, massive tie rod frame...square gibbing...features like these add up to *enduring* speed. For ease of operation there's ample room in front and back for die setting and space *under* the press for tote boxes or stacking chutes. Naturally, if you use large quantities of stampings this is the press that makes them. You will, however, be surprised to learn, that H-P presses can be set up so quickly and efficiently that more and more firms are using them for short run work.

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E. W. BLISS COMPANY · Canton, Ohio

BLISS is more than a name... it's a guarantee

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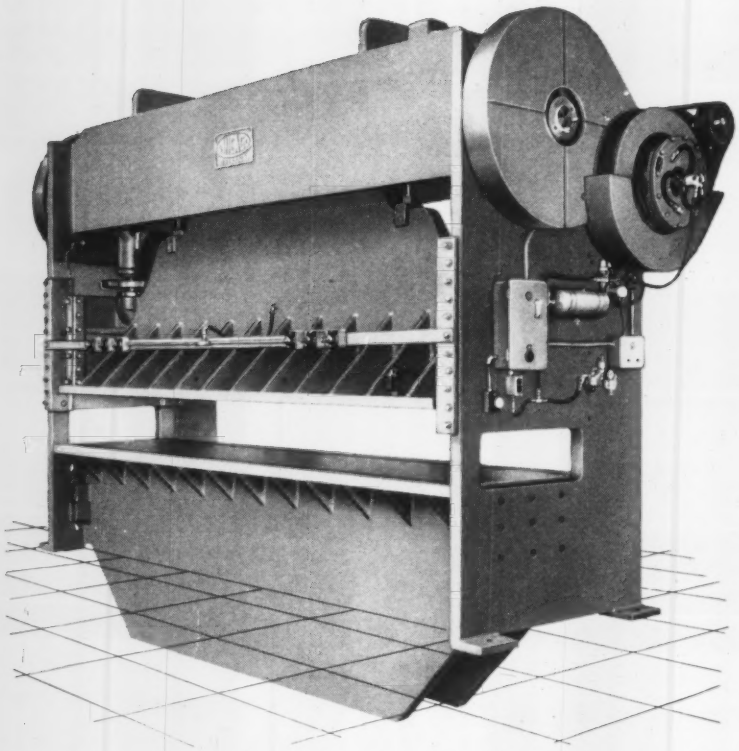


CHICAGO DREIS & KRUMP

PRESSES
STRAIGHT-SIDE TYPE

large die area
capacities up to 400 tons

This is a typical model of CHICAGO straight-side-type presses used for multiple punching, notching, and trimming operations. This press with a die area of 48 inches by 198 inches has a capacity of 200 tons.

Complete recommendations for any job on request.

8674

CHICAGO DREIS & KRUMP

Press Brakes • Straight-Side-Type Presses • Press Brake Dies
Hand and Power Bending Brakes • Special Metal-Forming Machines

DREIS & KRUMP MANUFACTURING CO.
7458 South Loomis Boulevard, Chicago 36, Illinois

LETTERS

(Concluded from Page 10)

Page 42), you say the Association of Missile and Rocket Industries offers a salesman's guide listing missile contractors and key personnel.

Will you supply me with the street address of the association please?

G. S. Berge
Manager-Marketing
Plastics Dept.
General Electric Co.
Chicago

• *The address is 1079 National Press Bldg., Washington 4, D. C. Kendall Hoyt is executive director.*

Exploring Space Age Metals

I would appreciate a copy of the fine article, "Needed: Facts on Space Age Metals" (June 16, Page 102).

E. B. Evans
Assistant Professor
Department of Metallurgical Engineering
Case Institute of Technology
Cleveland

Pricing Article Is Top Notch

Please send a copy of your topnotch article, "Pricing for Profit" (June 16, Page 87).

N. E. Berkholtz
Process Engineer
Ordnance Div.
Minneapolis-Honeywell Regulator Co.
Hopkins, Minn.

• • •

This article is one of the finest I have read on this subject. We would be grateful for two copies for circulation in our management group.

Louis E. Harrod
Winchester Electronics Inc.
Norwalk, Conn.

• • •

We believe this article will be of great assistance to us when we consider forthcoming price increases of our industrial products.

Donald R. Herzog
Solar Aircraft Co.
San Diego, Calif.

Timely Value to Company

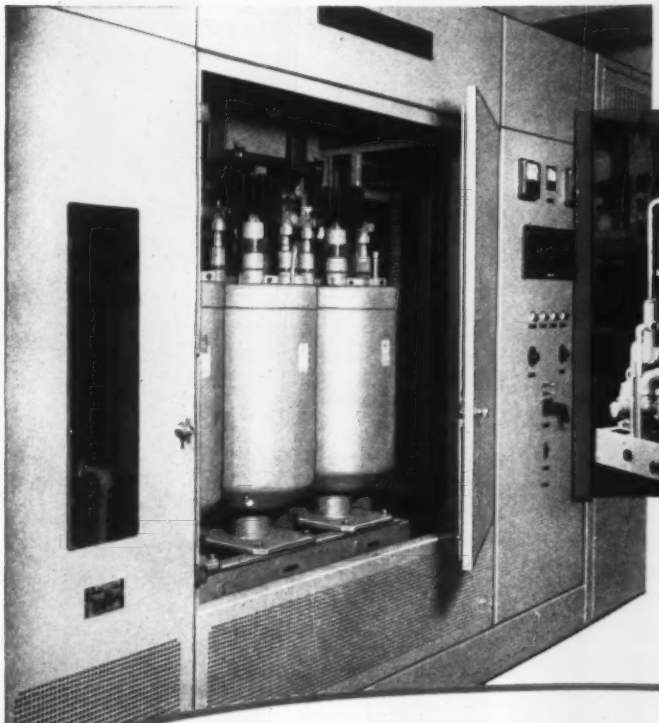
We would appreciate six copies of the article, "Electrical Steels: How To Choose and Improve Them" (June 9, Page 116). We find this article to be of great interest to our salesmen and order deskmen. Its educational value to our company is both real and timely.

Don Swanbeck
Sales Manager
American Steel & Aluminum Corp. of Massachusetts
Cambridge, Mass.

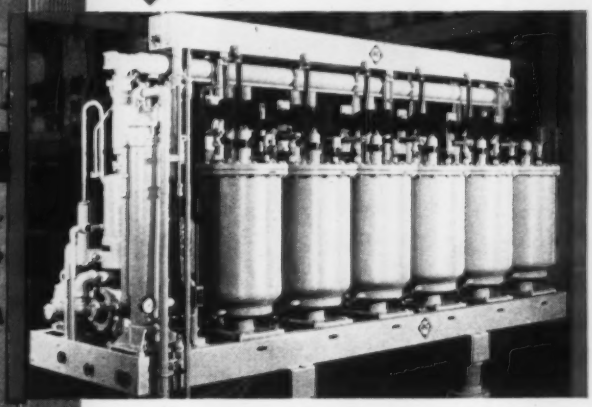
Series Unusually Interesting

Kindly send four copies of your Program for Management articles published so far this year. We have found them unusually interesting.

M. E. Wertz
Director of Industrial & Labor Relations
Lehigh Structural Steel Co.
Allentown, Pa.



Open pumped tube unit permits easy access for inspection. Easy to recondition in field.



Enclosed sealed tube unit conserves space, cuts installation costs, eliminates need for vacuum pumping system.

ALLIS-CHALMERS

Mercury Arc Rectifiers

Pumped or Sealed? Open or Enclosed?

Here's how Allis-Chalmers can help you choose a rectifier for your job—

BOTH sealed and pump-evacuated tube rectifiers offer distinct advantages, depending upon the application. Whether your rectifier should be open or enclosed construction also depends on the application. Since Allis-Chalmers offers you a choice of sealed or pumped tubes in either open or enclosed construction, you get an unbiased recommendation, based on a study of your needs, and not on commercial expediency. And you can be sure of unsurpassed reliability and ease of operation, as proved in hundreds of Allis-Chalmers installations.

Only Allis-Chalmers Excitron Rectifiers give you all these important advantages—

- **Fixed excitation anode** does not contact mercury — is independent of level, turbulence or impurities.
- **Continuous excitation** eliminates need for reignition — pilot arc always present.
- **Grid phase control** located in clean region near anode where ion density is lowest.
- **Internal cooling system** provides high heat transfer with seamless tube coil.
- **Arc-over-free tube** eliminates arc-over danger by insulating entire arc path.
- **Enameled anode seals** provide high strength, trouble-free seal.

For detailed information on mercury arc rectifiers contact your nearest A-C office, or write Allis-Chalmers, Industrial Equipment Division, Milwaukee 1, Wisconsin, for bulletin 12B8494.

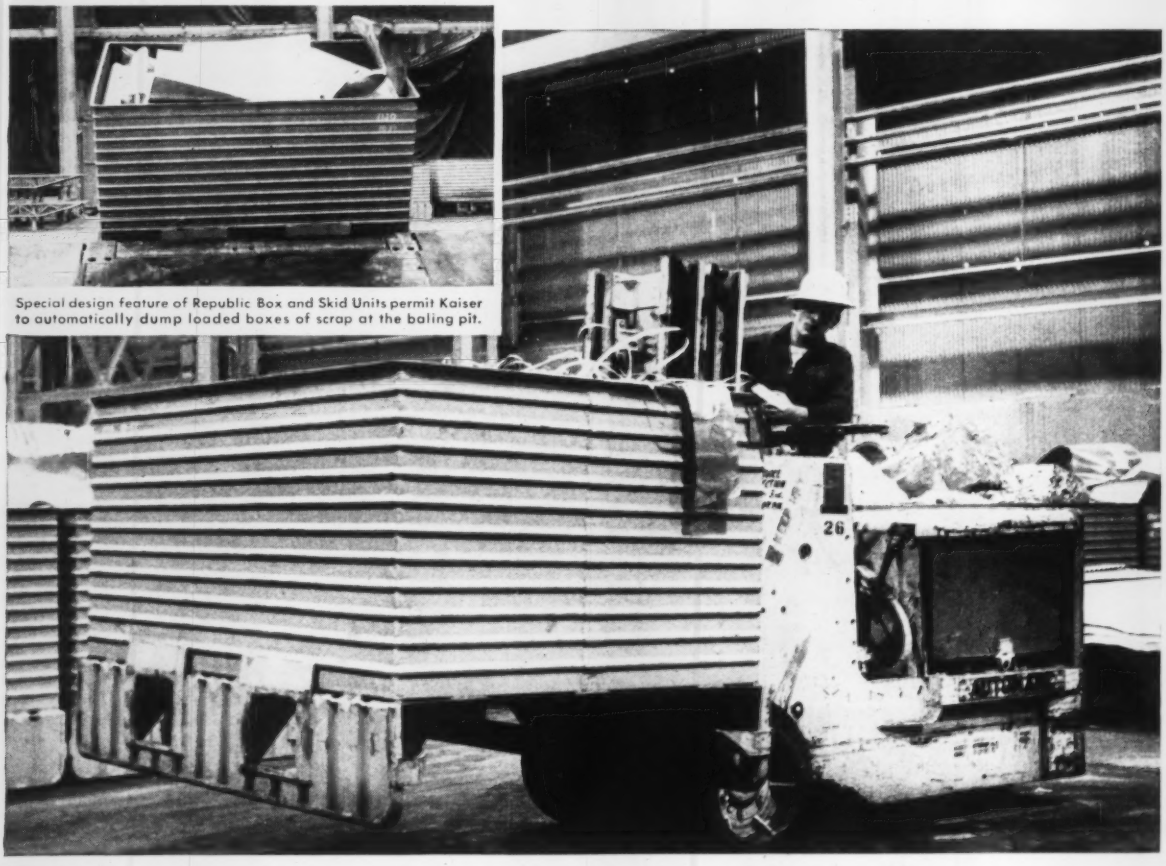
ALLIS-CHALMERS

A-C ALLIS-CHALMERS

A-5560

New Materials Handling Ideas from Republic

STEEL BOXES SERVE AS PORTABLE WAREHOUSES, PROVIDE SPEED, ACCURACY IN HANDLING SCRAP



Special design feature of Republic Box and Skid Units permit Kaiser to automatically dump loaded boxes of scrap at the baling pit.

THESE REPUBLIC STEEL BOX AND SKID UNITS ARE PERFORMING DOUBLE DUTY at Kaiser Aluminum & Chemical Corporation's new Ravenswood, West Virginia Works. The units play an important role in helping Kaiser maintain its scrap identification and separation system.

The boxes are used first in finishing areas where scrap is generated. When filled, each box is tagged to indicate the type of alloy it contains. Then it is picked up and moved by fork lift truck to a storage area where it serves as a portable warehouse. The boxes remain in storage until the scrap is scheduled for baling and remelt.

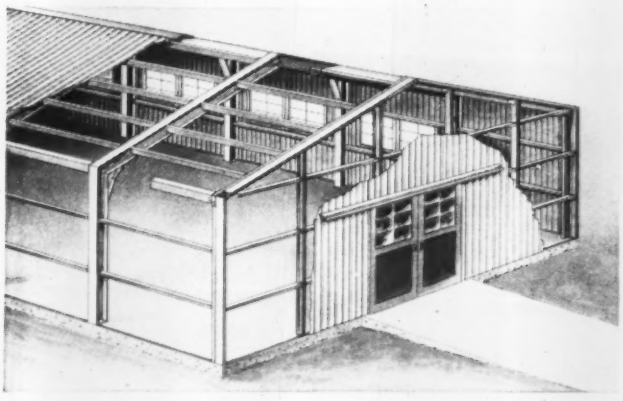
The boxes, designed and built by materials handling specialists at Republic's Berger Division, measure 6′ 5″ long, 4′ 6″ wide, and 4′ 1½″ high. They are built for 8000 lb. load capacity. The skid sections are designed for four-way entry by fork truck to provide easy handling in restricted space. This design feature also permits the boxes to be dumped automatically by a tipping device at the baling pit.

In addition to fast, accurate scrap handling, Kaiser should also benefit from future savings in maintenance costs. Corrugated construction of the box and skid units adds strength and rigidity, assures long service life at the lowest per-year cost.

Talk over your handling or storage problems with a Republic Specialist. He will help you select or design a standard or special unit that could save time, cut costs, simplify an operation. There is no obligation. Contact your Republic Materials Handling Representative. Or mail the coupon.

SPACE-SAVING HIGH STACKING WITH THE WORLD'S STRONGEST SHELVING. It's Wedge-Lock Steel Shelving manufactured by Republic's Berger Division. The secret of high stacking is in Wedge-Lock's exclusive sway-proof joint that actually becomes tighter as the load increases. Wedge-Lock includes the three essentials of good steel shelving: a post that will not buckle, a reinforced shelf that does not sag, a concealed sway-proof joint. Berger storage engineers will help you design an installation to fit your needs. Mail coupon for details.

SIMPLIFY PALLETIZING AND STACKING, SAVE SPACE with Republic Steel Pallet Racks. The savings of palletized handling now can be applied to bulky, uneven, odd-lot, and fragile materials. Republic Steel Pallet Racks make palletizing practical. Tubular steel supports adjust every six inches to handle palletized material of any height. Select single pallets from any level without restacking. Two-way entry permits loading and unloading from either side. Send coupon for complete specifications.



TRUSCON'S NEW COMPLETE STEEL BUILDINGS are low in cost, quickly erected, reusable. These new "Budget Buildings" by Republic's Truscon Division bring the cost of additional storage space down low. Simplified design permits fast on-site erection. No painting needed. Siding, roofing, doors, windows, hardware all included. Immediate delivery in widths 32, 36, 40, 44, and 48 feet . . . 12- and 14-foot heights. Lengths as long as you want them. Send coupon for bulletin covering complete facts.

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World's Widest Range of Standard Steels and Steel Products

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1441 REPUBLIC BUILDING • CLEVELAND 1, OHIO

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Send more information on:
☐ Materials Handling Equipment ☐ Steel Pallet Racks
☐ Wedge-Lock Steel Shelving ☐ Truscon "Budget Buildings"

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Company_____

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and many tool sharpening operations

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One compact machine performs 28 different grinding jobs

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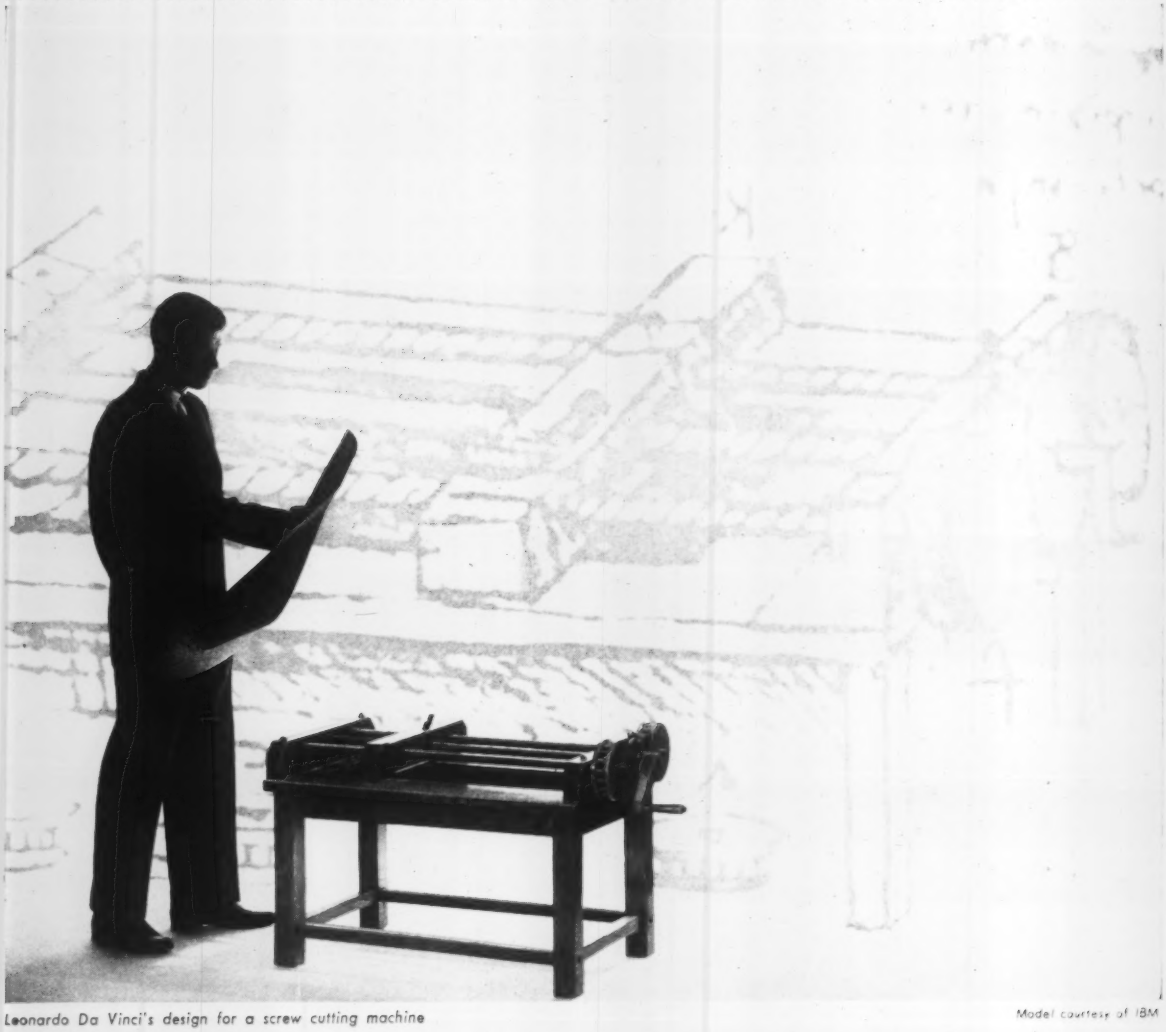
creative designing calls for an open mind

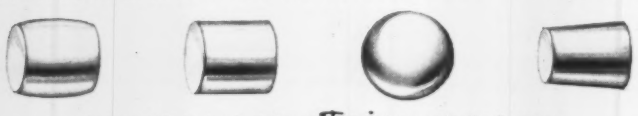


Leonardo Da Vinci's design for a screw cutting machine

Model courtesy of IBM

EVEN THIS DA VINCI DESIGN COULD HAVE BEEN BETTER WITH HELP FROM AN SKF ENGINEER.

The kind of bearings your SKF engineer recommends depends solely on your requirements, not on what he has to offer. That's because the SKF line includes all four basic types of ball and roller bearings in many thousands of sizes. This gives him the kind of flexibility he needs to keep an open mind on any bearing problem. Give your problem to SKF and see. 7832



Spherical, Cylindrical, Ball, and "Tyson" Tapered Roller Bearings

EVERY TYPE—EVERY USE

SKF

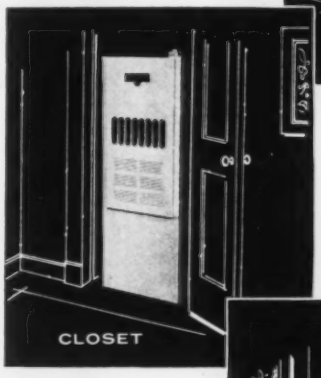
SKF INDUSTRIES INC. PHILADELPHIA 32, PA

*REG. U. S. PAT. OFF.

Armstrong Furnace Co.
forms, stamps, then welds Youngstown Cold-Rolled Sheets to fabricate the cabinets for their complete line of oil and gas fired furnaces.

Accent on Excellence

Youngstown cold-rolled sheets



ARMSTRONG
FURNACE COMPANY

Today's modern home owners are partial to heating units that tuck back out of the way—blend right in with their over-all decor. As a result, more and more are turning to the beautiful new Counterflow units produced by Armstrong Furnace Company of Columbus, Ohio.

Because exterior appearance is so important to customer satisfaction, Armstrong fabricates cabinets for their complete furnace line from the finest flat-rolled steel available anywhere—Youngstown Cold-Rolled Sheets.

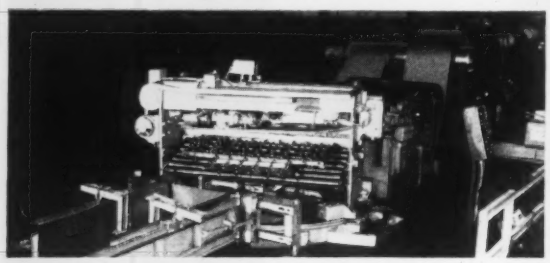
Wherever steel becomes a part of things *you* make, the high standards of Youngstown *quality*, the personal touch in Youngstown *service* will help you create products with an "accent on excellence".

QUALITY YOUNGSTOWN SERVICE

THE
YOUNGSTOWN
SHEET AND TUBE COMPANY

Manufacturers of Carbon, Alloy and Yoloy Steel, Youngstown, Ohio

Cincinnati Shear swivels for mitre cuts at Budd



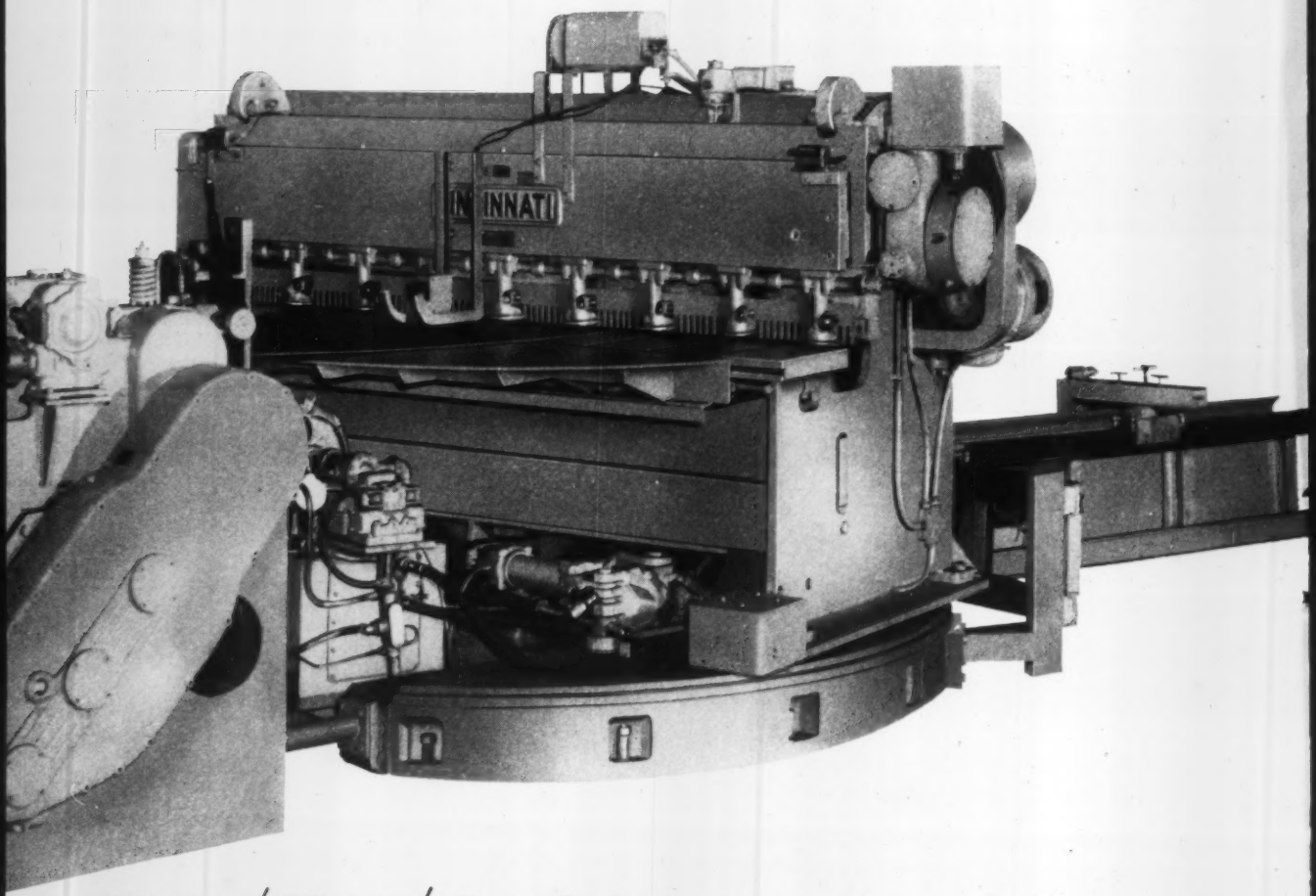
This Cincinnati Shear is an integral part of an automatic decoil and shear line at The Budd Company's Gary, Ind., plant. It is used for straight and mitre shearing of coil stock into sheets.

Mounted on a swiveling base, the shear can be rotated 22½° to either side of center, so the operator can pre-set the desired angle of cut.

Accuracy must be within ⅛″ per 80″ of feed. Sheet widths range from 24″ to 72″ and thickness from 21 to 16 gauge (.0349″ to .0625″). Since the operation must be automatic and continuous to be economical, Cincinnati dependability is a vital asset.

This shear was specially engineered for The Budd Company. However, most of its profitable features are available with standard Cincinnati Shears. They include powerful hydraulic hold-downs, all-steel interlocked construction, and one-clearance shearing of different metal thicknesses.

Complete details on Cincinnati All-Steel Shears are included in Catalog S-7R. Write to Dept. C.

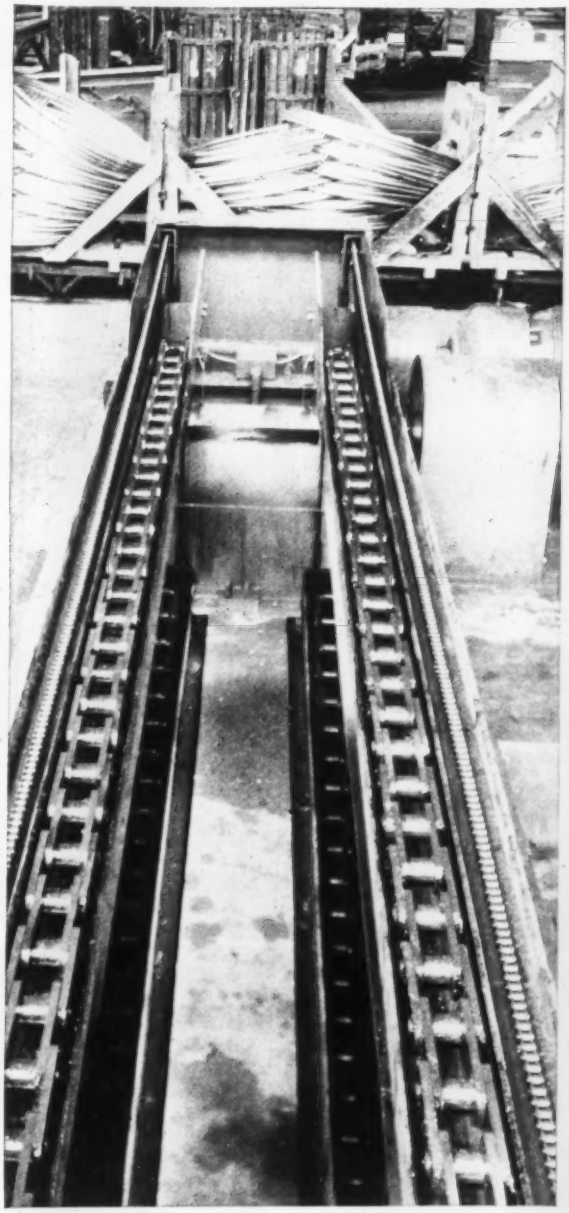


Shapers / Shears / Press Brakes

THE **CINCINNATI SHAPER** CO.

Cincinnati 11, Ohio, U.S.A.

Link-Belt draw bench chains hold accurate pitch and sprocket contact



LINK-BELT 6-IN. PITCH SS-1326 CHAIN operates at speeds up to 400 feet per minute. Note strands of Link-Belt RC-80 roller chain which serve to return the gripper head back to the die stand so that another draw can be made.

Double strand SS-1326 bushed chain accommodates high operating speeds

This bushed type chain draws from one to five 130-ft. tubes at speeds up to 400 feet per minute on this 36,000-lb. draw bench. Design and structural features of Link-Belt SS class bushed chain make such high speeds possible.

Bushings perform operational function

Chain bushings play a major role in the operation of dual-chain draw benches. They engage a pair of pivoted hooks connected to the gripper head. The chain then pulls the gripper head and tubes through the die stand. When the draw is completed, the hooks are cammed away from the chain and the chain continues to operate.

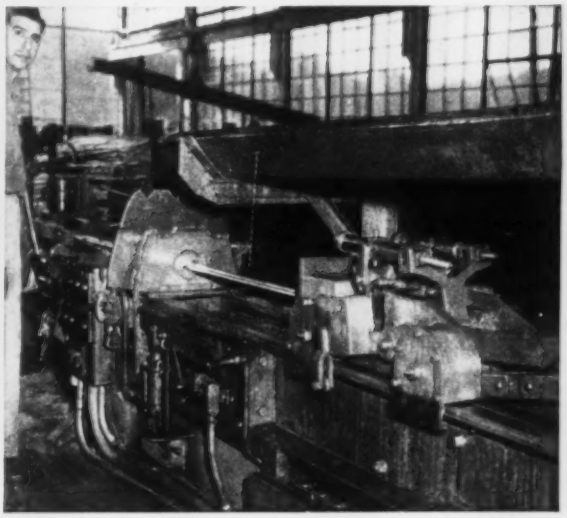
Structural advantages of bushed chain

Link-Belt SS class chain also offers rugged construction. The hardened steel bushings, securely fitted and locked in sidebars, give a durability and strength that permit even higher operating speeds than are possible with standard block chain.

Special machining of parts extends life of this draw bench chain

Whether it's for a 5000- or a 100,000-lb. bench, Link-Belt draw bench chains are built to last. Parts are accurately machined after hardening by a special process that assures longer chain life on even the highest chain pull applications.

SS class draw bench chains are available in a variety of pitches and strengths to suit any requirement. They are of all-steel construction, and well balanced. They are furnished in either bushed type or block link design. Close pitch control and correct sprocket contacting surfaces are maintained at all times.



LINK-BELT SS-1325 CHAIN, 130 ft. long, is used on each of four draw benches in this copper tubing redrawing plant. Accurate control of raw materials and manufacturing processes is your assurance of close pitch and correct sprocket contact.

HEADQUARTERS for chains, sprockets and other Link-Belt conveying and mechanical power transmission products is your nearby Link-Belt factory branch store or authorized stock-carrying distributor.

LINK-BELT

CHAINS AND SPROCKETS

LINK-BELT COMPANY: Executive Offices, Prudential Plaza, Chicago 1. To Serve Industry There Are Link-Belt Plants, Sales Offices, Stock Carrying Factory Branch Stores and Distributors in All Principal Cities. Export Office, New York 7; Canada, Scarboro (Toronto 13); Australia, Marrickville, N.S.W.; South Africa, Springs. Representatives Throughout the World. 14,809

By investing dollars wisely . . .

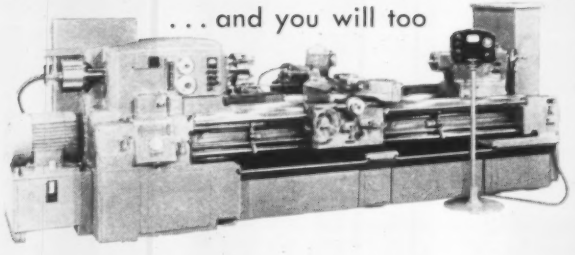
and meshing Monarch Air-Gage Tracer Dyna-Shift Lathes into the production line . . .

this quality gear maker

Cuts Turning Costs over 50%

. . . and you will too

Monarch
TURNING MACHINES
FOR A GOOD TURN FASTER . . . TURN TO MONARCH



Let Western Gear people tell you how their investment is paying off—quickly!

(The following statements were all made voluntarily by shop men of Western Gear Corporation's Lynwood Works, Lynwood, California.)

A. "We combine know-how with the finest equipment to machine 'impossible' tolerances in production line quantities. Standard machinery just will not do the job.

"On one job the metal involved was nitrolloy and our standard lathes required 30 minutes. With the MONARCH Dyna-Shift lathe, we produce the same part in only 6 minutes, an 80% reduction of production time."

B. "In another instance, our standard machine required 75 minutes to machine one part, as compared to only 40 minutes on a MONARCH lathe. Production rejects on standard lathes averaged 7% to 8% on these parts (turned from 4140 steel) . . . but we've almost eliminated rejects on the MONARCH lathes, saving as much as 50% on material costs on some parts."

C. "The manufacture of gears to total composite errors of .0005", and tooth-to-tooth errors of .0002", is an everyday occurrence here. MONARCH lathes have enabled us to maintain these tolerances virtually eliminating rejects and reducing production time per unit by a drastic margin."

D. "The MONARCH tracer is a production machine capable of turning out different diameter sizes in lots from 100 to 500 pieces and up from the template . . . yet it does the job without variation, and the only detectable changes occur because of the tool wear."

Isn't it time you investigated the greatest combination in lathes to date—the MONARCH Preselector Dyna-Shift with Air-Gage Tracer? Write for our new booklet No. 2609. It's loaded with many examples of Air-Gage Tracer savings.

The Monarch Machine Tool Company, Sidney, Ohio

CALENDAR
OF MEETINGS

July 23-26, National Tool & Die Manufacturers Association: Summer board meeting, Mt. Washington Hotel, Bretton Woods, N. H. Association's address: 907 Public Square Bldg., Cleveland 13, Ohio. Executive vice president: George S. Eaton.

Aug. 11-14, Society of Automotive Engineers: National west coast meeting, Ambassador Hotel, Los Angeles. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

Aug. 19-22, American Institute of Electrical Engineers: Pacific general meeting, Hotel Senator, Sacramento, Calif. Institute's address: 33 W. 39th St., New York 18, N. Y. Secretary: N. S. Hibshman.

Aug. 19-22, Western Electronic Show & Convention: Pan-Pacific Auditorium, Los Angeles. Information: WESCON, 1435 S. LaCienega Blvd., Los Angeles 35, Calif.

Sept. 7-12, American Chemical Society: National chemical exposition and conference, International Amphitheatre, Chicago. Society's address: 1155 16th St. N.W., Washington 6, D. C. Executive secretary: Alden H. Emery.

Sept. 8-11, Society of Automotive Engineers: Farm, construction, and industrial machinery meeting, production forum and engineering display, Milwaukee Auditorium, Milwaukee. Society's address: 485 Lexington Ave., New York 17, N. Y. Secretary: John A. C. Warner.

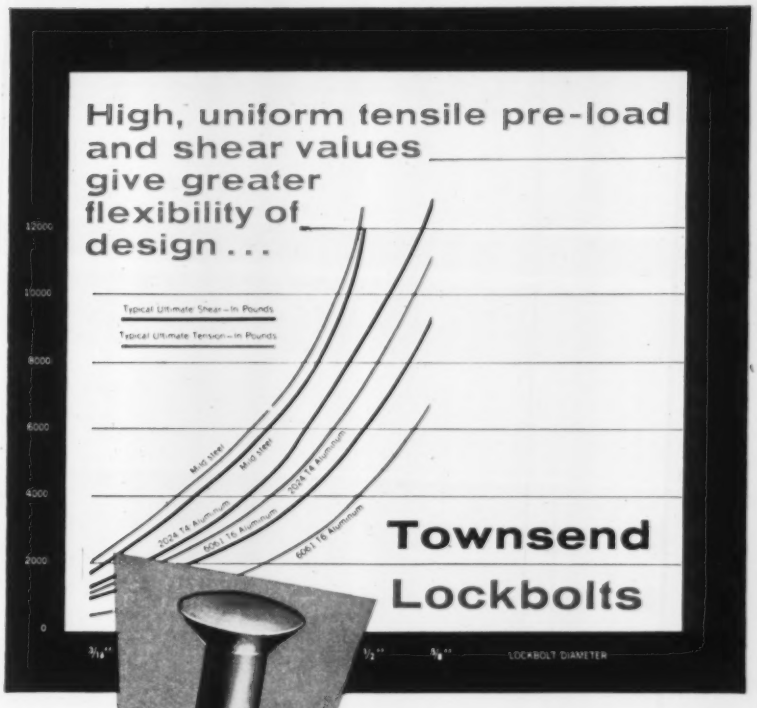
Sept. 10-11, American Die Casting Institute: Annual meeting, Edgewater Beach Hotel, Chicago. Institute's address: 366 Madison Ave., New York 17, N. Y. Secretary: David Laine.

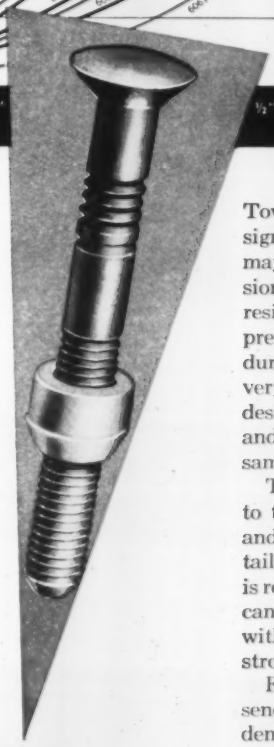
Sept. 11-12, Refractories Institute: Fall meeting, Broadmoor Hotel, Colorado Springs, Colo. Institute's address: 1801 First National Bank Bldg., Pittsburgh 22, Pa. Executive secretary: Avery C. Newton.

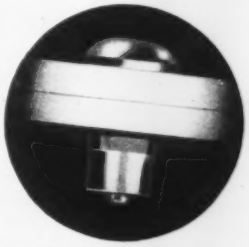
Sept. 14-19, Instrument Society of America: Annual instrument-automation conference and exhibit, Convention Hall, Philadelphia. Society's address: 313 Sixth St., Pittsburgh 22, Pa. Executive director: William H. Kushnick.

Sept. 16-18, Electronic Industries Association: Fall meeting, St. Francis Hotel, San Francisco. Association's address: 1721 DeSales St. N.W., Washington 6, D. C. Secretary: James D. Secrest.

Sept. 17-19, National Industrial Conference Board Inc.: General marketing conference, Waldorf-Astoria Hotel, New York. Board's address: 460 Park Ave., New York 22, N. Y. Secretary: Herbert S. Briggs.







Townsend lockbolts* give the designer great flexibility, for they may be used in either shear or tension applications, and have great resistance to fatigue. A high tensile pre-load is imparted to the joint during installation, which gives a very high shear value. No overdesign is necessary, because shear and tensile pre-load values are the same in every joint.

The setting gun swages the collar to the locking grooves on the pin, and breaks off the projecting pin tail as a pre-determined break-load is reached. The gun's cycling action cannot be altered, and even men with no special skill can produce strong, uniform, economical joints.

For more information on Townsend lockbolts, request a complete demonstration right at your desk, or write for Bulletin TL-101. Townsend Company, P. O. Box 237-C, New Brighton, Pa.

*Licensed under Huck patents RE 22,792; 2,114,493; 2,527,307; 2,531,048; 2,531,049 and 2,754,703

The Fastening Authority

Townsend

COMPANY • ESTABLISHED 1816

NEW BRIGHTON, PENNSYLVANIA

Sales Offices in Principal Cities

Cherry Rivet Division • Santa Ana, California

...*from any point of view*

From the management viewpoint — Brass is priced right . . . priced for *profit*.

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And to these unmatched qualities, *Bristol* Brass adds something extra special known as "Bristol Fashion," which means uniformity of product and speed of service such as you have never seen before. Burden of proof lies with us . . . call Ludlow 2-3161.

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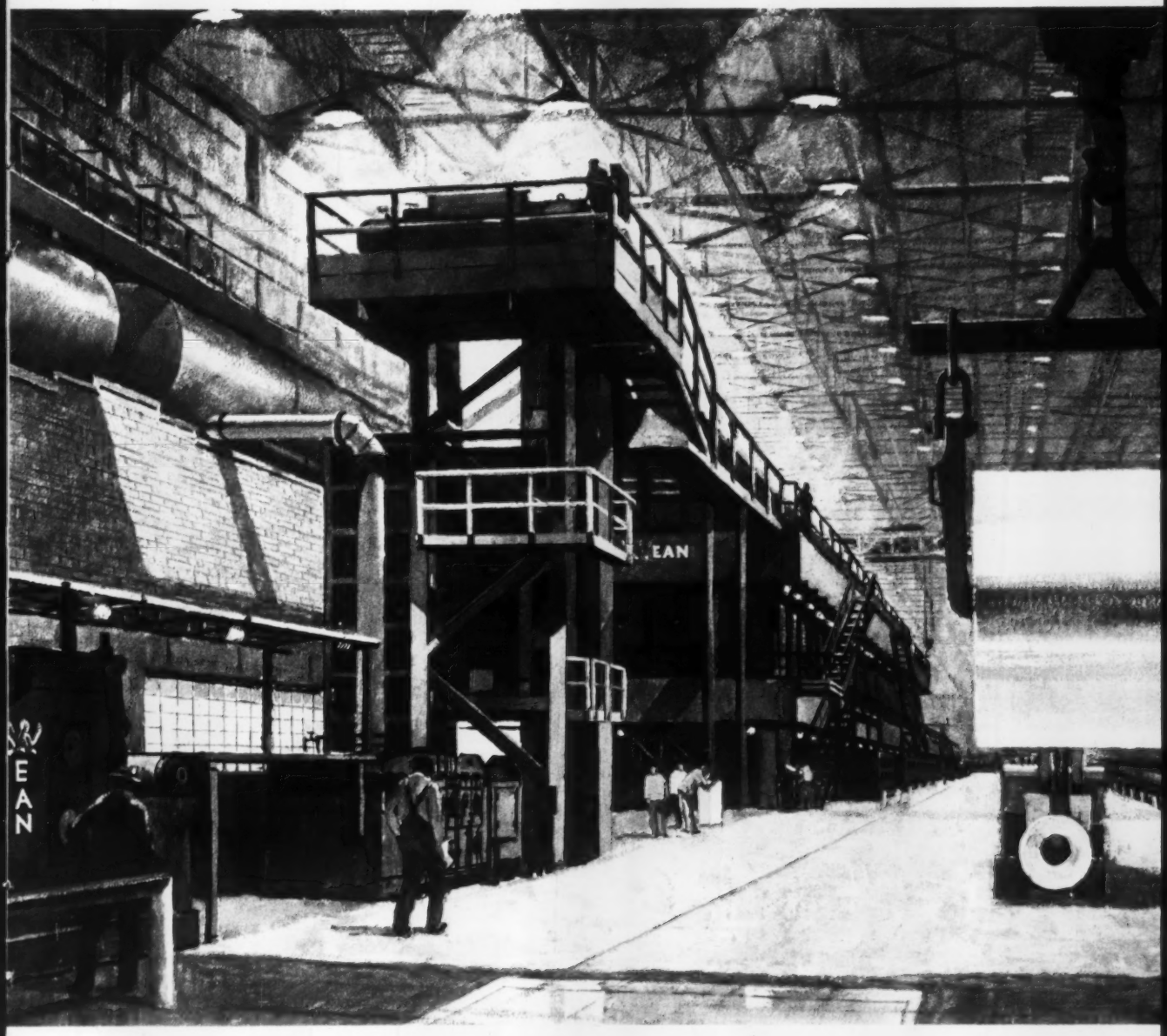
ACCURATE BRASS CORP. *(Subsidiary of The Bristol Brass Corp.)*, Bristol, Connecticut

Bristol-Fashion

means Brass at its best

THE BRISTOL BRASS CORPORATION • SINCE 1850 • MAKERS OF BRASS STRIP, ROD AND WIRE IN BRISTOL, CONNECTICUT
Bristol Brass has offices and warehouses in Boston, Buffalo, Chicago, Cleveland, Dayton, Detroit, Milwaukee, New York, Philadelphia, Pittsburgh, Rochester, Syracuse

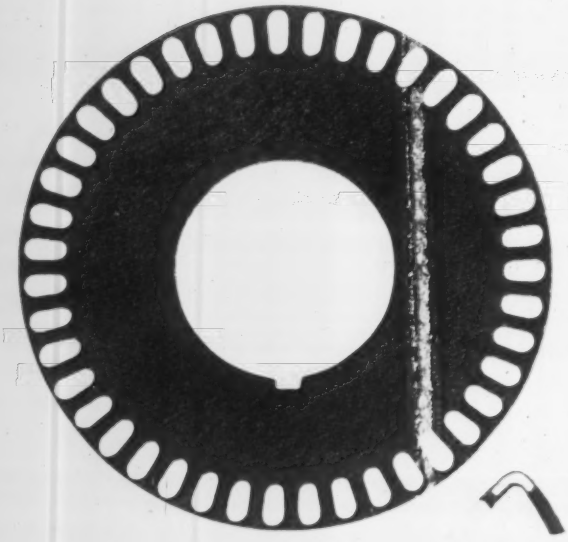
Wean, Weirton and Tinning . . .



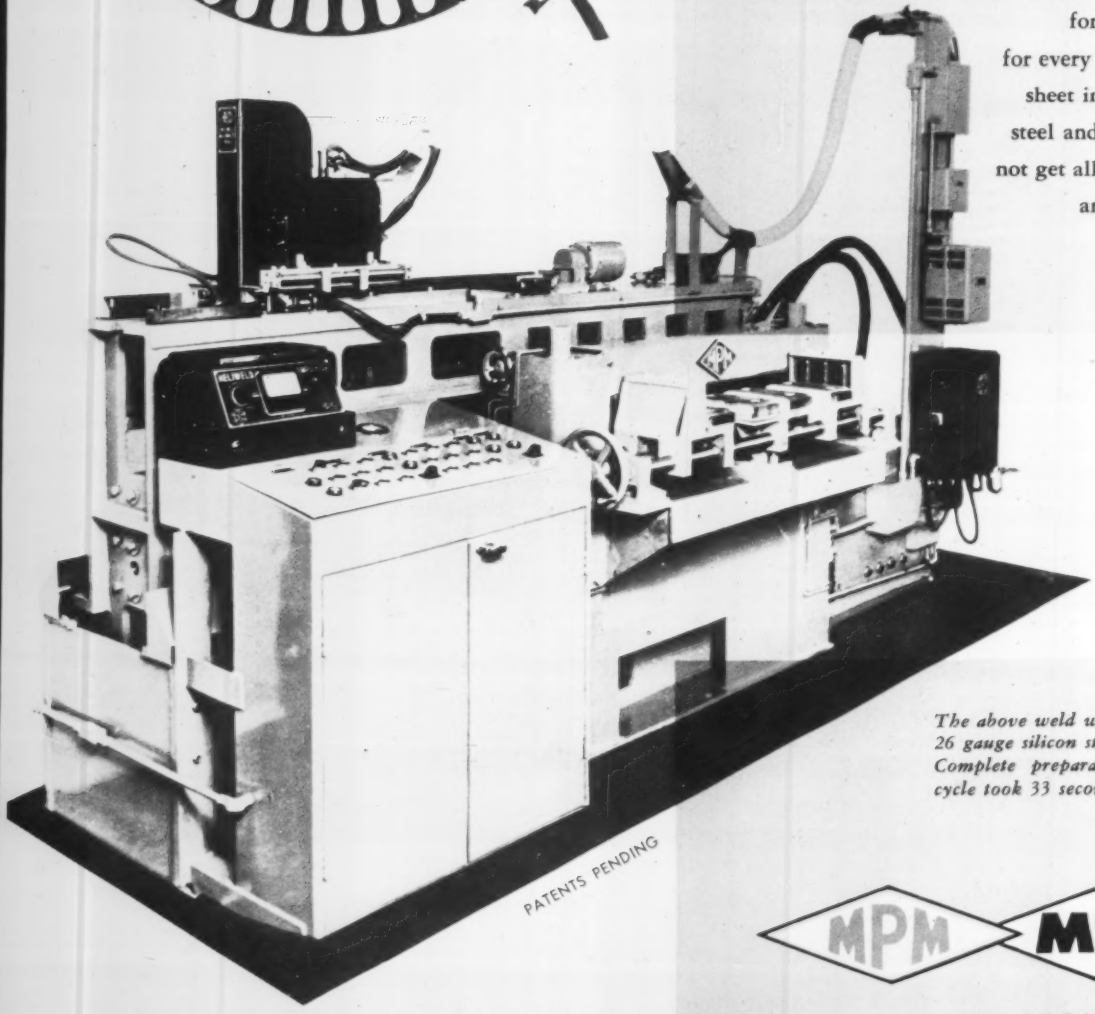
More than a city block long, this electrolytic tinning line is a true test of engineering precision. Through this line a continuous ribbon of steel travels at speeds up to 2000 fpm while being coated with a uniform layer of tin 30 millionths of an inch thick.
A Wean line is engineering precision at its best. Wean has engineered and constructed 47 electrolytic tinning lines.
These lines account for more than 75% of America's annual electrolytic tin plate production.

THE WEAN ENGINEERING COMPANY INC. · WARREN · OHIO

Silicon steel coil buildup made faster, more accurate by amazing MPM shearwelder



● The unretouched photo of the rotor lamination is a typical production butt-weld made on 26 gauge silicon steel by MPM's outstanding new Shearwelder. Perfect welds like this are a result of the exclusive positive guiding and clamping arrangement and welding technique developed by MPM engineers. Both shearing and welding are performed at the same station eliminating the chance for error that occurs when the work is moved from station to station, too, this MPM method speeds the operation. MPM manufactures a complete line of Shearwelders for every need, and for every type of strip and sheet including stainless steel and tin plate. Why not get all the facts on this amazing machine?

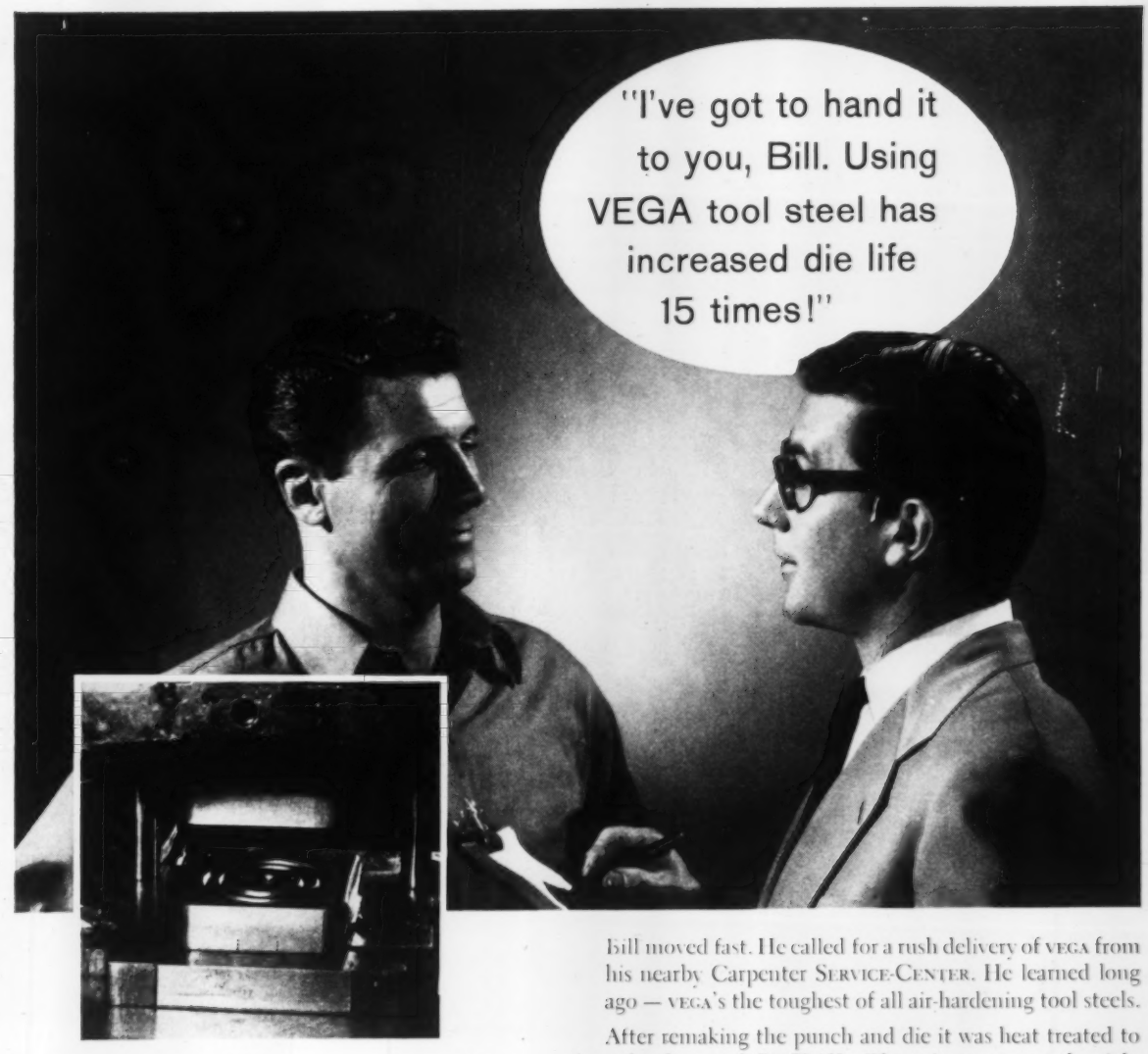


The above weld was made in joining 26 gauge silicon steel sheet 33" wide. Complete preparation and welding cycle took 33 seconds.

MPM McK

METAL PROCESSING MACHINE COMPANY • YOUNGSTOWN, OHIO

Subsidiary of THE McKAY MACHINE CO.



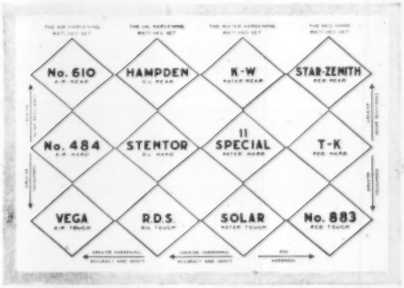
Bill's the new toolroom foreman, just joined the company. And he no sooner got settled than he was tossed a "hot potato".

The production department was using a compound punch and die for stamping parts out of 12- and 13-gauge hot rolled mild steel. The last die — one of many made from an oil-hardening grade — cracked after a run of 10,000 pieces. And the boss was fed up!

Bill moved fast. He called for a rush delivery of VEGA from his nearby Carpenter SERVICE-CENTER. He learned long ago — VEGA's the toughest of all air-hardening tool steels.

After remaking the punch and die it was heat treated to a hardness of Rc-58/60. Then it went on the job. 150,000 pieces went through before the tools were reworked. After annealing, machining and rehardening the tools, another run of 150,000 pieces is expected.

Why not try VEGA (Air-Tough) today. Over and above its high toughness, it gives you a combination of heat treating, diemaking and production benefits unmatched by any other steel. For fast service call your nearby Carpenter SERVICE-CENTER.



® U. S. Patent Office, The Carpenter Steel Co., Reading, Pa.

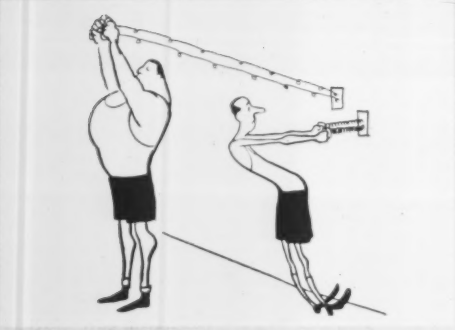
Carpenter STEEL

Matched Tool and Die Steels

The Carpenter Steel Co., 139 W. Bern St., Reading, Pa.

Export Dept.: The Carpenter Steel Co., Port Washington, N. Y.—"CARSTEELCO"

VISCOSITY COIL



EXECUTIVE COILS

SAFARI COIL

What do "Coils" mean to you?

Coils call to mind so many things. But if to you they mean springs, those mechanically precise activators of energy, then we're on common ground. Our organization specializes in all kinds—compression, extension, torsion, flat coil, volute . . . maintains unequalled engineering and manufacturing facilities throughout the nation. So let us supplement the work of your own engineers with our specialized knowledge and experience in the design and manufacture of springs, small stampings, and wire forms . . . made to your specifications.

Our "Picture Book of Springs" shows thousands of custom-produced parts, typical of our service. Write for a copy to pass along to interested people in your organization.

Associated Spring Corporation

General Offices: Bristol, Connecticut

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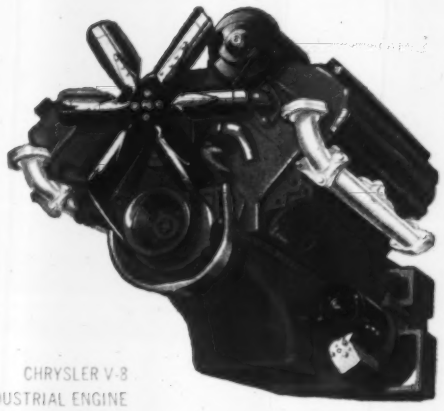
Canadian Subsidiary: The Wallace Barnes Co., Ltd., Hamilton, Ontario and Montreal, Quebec

5035

why Yale & Towne powers with Chrysler Industrial Engines



CHRYSLER V-8 INDUSTRIAL ENGINE powers Yale G3P Lift Truck.

Lift trucks operate under a wide variety of rugged conditions. The Yale Model G3P, for example, usually works outdoors in all kinds of weather and, frequently, over rough terrain. The engine is exposed to rain, dust, dirt; extreme heat and cold. Demands upon the engine vary from short periods of full capacity lifting to long periods of idling. Yale & Towne has found that Chrysler engines meet these on-the-job requirements with power to spare. Most Yale customers are familiar with Chrysler power in other industrial applications. They respect the reputation of Chrysler Industrial Engines for economical and trouble-free performance. They know from first hand experience how Chrysler's nationwide service organization helps reduce down-time losses.

YALE & TOWNE EXECUTIVES

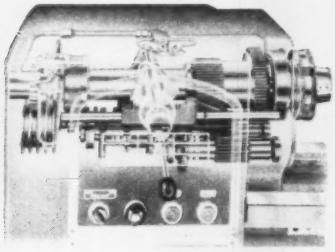
John A. Baldinger (left), Vice President, Yale Materials Handling Division; Thomas W. Curtin (right), Director of Purchases; Clyde R. Dean (seated), General Sales Manager. Yale Lift Trucks from 3,000 to 10,000 lb. capacity are powered by six-cylinder Chrysler Industrial Engines. Larger models (shown: Model G3P, 18,000 lb. capacity) are powered by Chrysler V-8 Industrial Engines with fluid coupling.

SEND for 1958 CHRYSLER INDUSTRIAL ENGINE CATALOG: Dept. C7, Industrial Engine Division, Chrysler Corporation, Detroit 31, Michigan.

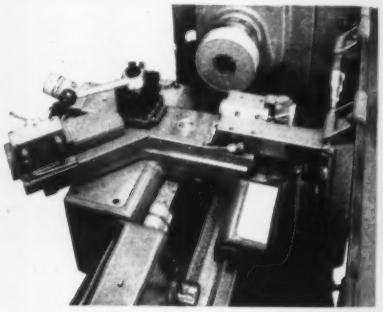
Chrysler
INDUSTRIAL ENGINES
INDUSTRIAL ENGINE DIVISION • CHRYSLER CORPORATION

BIG

lathe features at low cost!



Full 5 HP—all spur gears—anti-friction bearings—automatic filtered lubrication—9 spindle speeds to 3000 RPM.

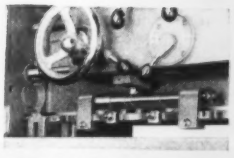


Compact, efficient 45° tracing mechanism—trouble-free, exclusive Lodge & Shipley design.

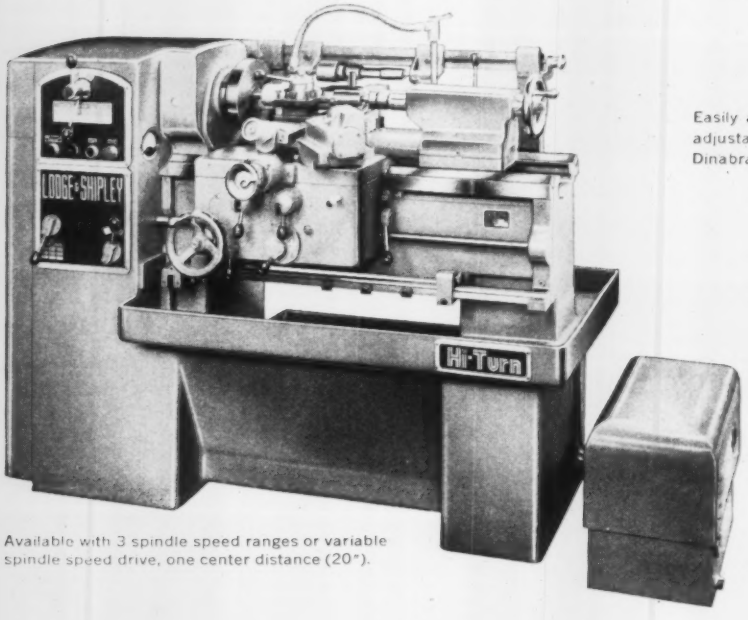
why pay $20,000 when you can buy a LODGE & SHIPLEY 1307 (10")

Hi-Turn COPYMATIC

TRACER LATHE for less than $10,000?

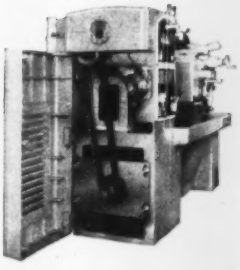


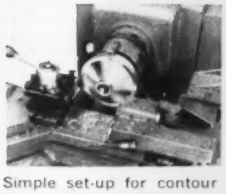
Template-type multiple length stops for duplicating shoulder lengths.



Available with 3 spindle speed ranges or variable spindle speed drive, one center distance (20").

Easily accessible and adjustable drive with Dinabrake motor.





Simple set-up for contour facing operations.

The **HI-TURN 45° COPYMATIC Tracer Lathe** is extremely rugged, built to do production jobs at time and money-saving rates. You get Lodge & Shipley quality features at a price substantially below many lathes having less horsepower and light construction. If you perform manufacturing or tracer lathe operations, put them on a lathe built to do the job at lowest cost. The features shown here are but a few of many . . . for complete details, request Bulletin DM-4 from:

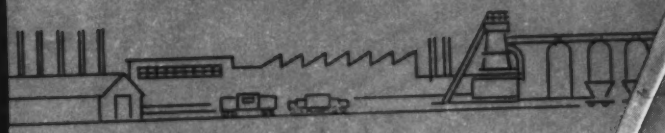
The Lodge & Shipley Co., 3070 Colerain Ave., Cincinnati 25, Ohio

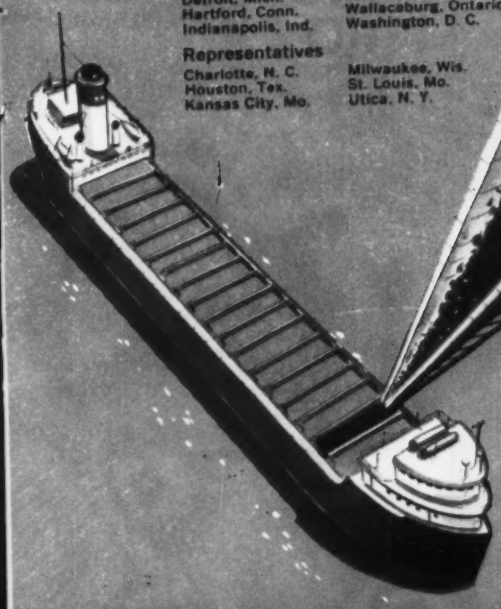
NEW JESSOP STEEL PLATE

offers exceptional resistance to wear

New Jessop TRU-WEAR-FM solid or clad plate is rolled from a special analysis steel designed for exceptional resistance to abrasive wear. When compared with other steels in this category, it offers less distortion during heat treatment, and up to 10 times the wear resistance with equal impact strength. Fabricators of chutes, mold boxes, special cutters and other applicable equipment should take note.

For additional information, write or call Jessop Steel Company at Washington, Pa. or any of the addresses shown below.





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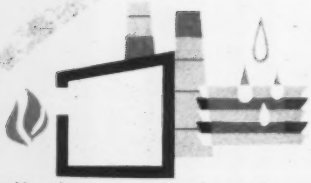
KAISER ENGINEERS

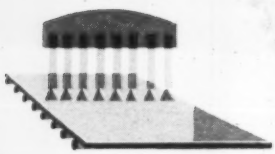
—has designed and built,

—is designing and building,

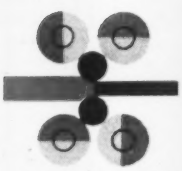
—will design and build...



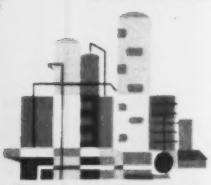
Air pollution control and water treatment



Sinter plants



Rolling mills

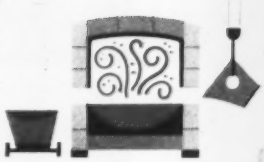


By-products plants

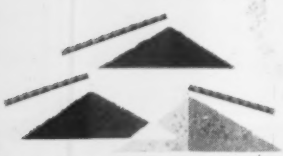
Kaiser Engineers designs and builds every part of a steel mill. Been doing it for years. KE has the experience, and the ingenuity, to develop time-cutting, cost-saving new ways to build and operate. The result is a better plant, sooner, for less.

Experience, ingenuity—and a cost-conscious approach. This is what KE can apply to your steel plant expansion program right now. Call or write—today.

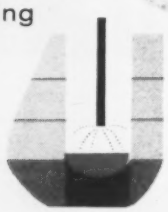
Pittsburgh, 330 Grant St., AT 1-7992
New York, 300 Park Ave., PL 9-1100
Oakland, 1924 Broadway, CR 1-2211



Open hearths



Ore beneficiation and handling



L-D Process plants

Blast furnaces

Pipe mills

KAISER ENGINEERS

KAISER ENGINEERS engineers-contractors
Contracting since 1914

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Finish obtained in machining REX M-2-S eliminates the need for finish grinding this 4" x 4" unground double thread cutting hob.

Hobs seldom need finish grinding when made of low cost REX M-2-S

This is the actual finish obtained—without costly finish grinding—with REX M-2-S,® Crucible's *sulfur-bearing*, tungsten-molybdenum type high speed steel. The chemistry of this resulfurized steel readily provides the machinability needed for the final, critical "backing-off" operation in making hobs. It doesn't tend to tear or produce rough finishes—as nonsulfur-bearing steels of this type so often do.

REX M-2-S costs about 30% less than T-1 type, too, because it's lower priced per pound, and provides 5.4% more linear feet per pound.

Crucible REX M-2-S is also equal in red hardness to the T-1 type, and even more resistant to abrasion. It's also tougher than any other tungsten type high speed steels, and hardenable over a wider range than any other molybdenum high speed steels.

Qualities like these make REX M-2-S extremely suitable (and economical) for broaches, chasers, lathe tools, reamers, taps and hobs as well as other tools normally requiring high speed steel.

For further information, just ask for details on REX M-2-S—or all the Crucible high speed steels today. Write: *Crucible Steel Company of America, Dept. TG15, The Oliver Building, Mellon Square, Pittsburgh 22, Pa.*

CRUCIBLE STEEL COMPANY OF AMERICA

Canadian Distributor—Railway & Power Engineering Corp., Ltd.

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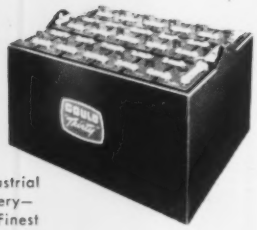

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You want the most for every dollar invested in batteries. Gould can help you.

Batteries get harder use some days, lighter use other days. Operating conditions are seldom constant. Frequent over-discharging and over-charging, which is not recognized and corrected, can seriously harm a battery.

You can avoid this possibility. Assure maximum operating efficiency, lower maintenance costs, and longer battery life, by letting Gould help you establish a simple effective preventive maintenance program for your batteries.

Can't you see how you will benefit from such a program? Call your local Gould representative for details. No obligation. He's listed under "Batteries, Industrial" in the yellow pages. Gould-National Batteries, Inc., Trenton 7, N. J.

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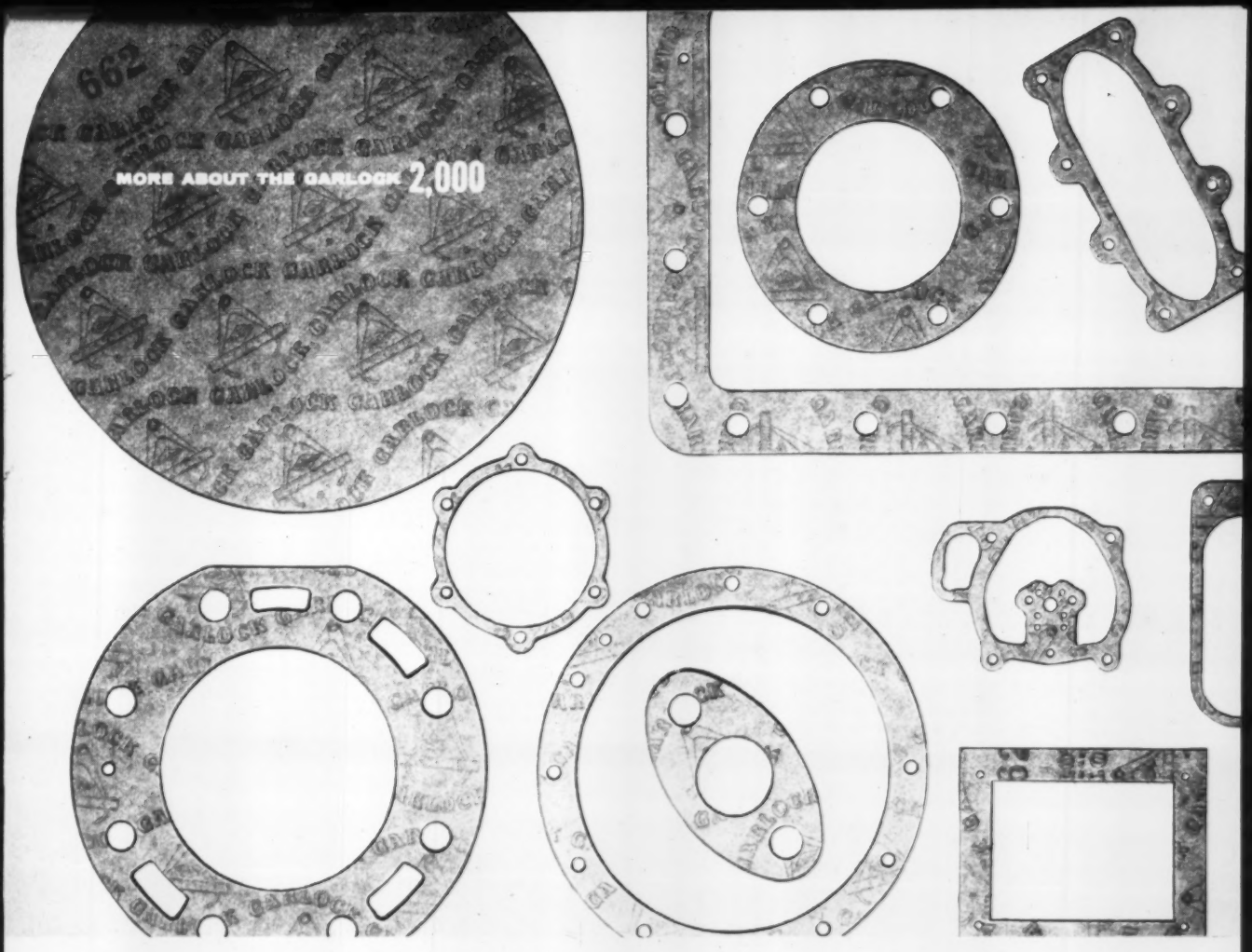

WON'T SHRINK...WON'T CHANGE SHAPE

GARLOCK 662 GASKETING MATERIAL

Tests prove Garlock 662 is best for use against oils, solvents, and water to 300° F. It won't shrink or change shape; will not corrode aluminum, magnesium, etc.; is resilient, compressible, and non-porous . . . in fact 662 has everything you want in a gasket for crankcases, gearcases, oil pans and other applications involving moderate internal pressures.

662 is made from a cork paper base impregnated with BUNA-N. Does not contain glycerine and is approved by Underwriters' Laboratories, Inc. for use against hazardous liquids such as naphtha, benzine, fuel oils, etc. Available in 48″ wide rolls from $\frac{1}{64}$″ to $\frac{1}{8}$″ thick and in sheets 48″ x 48″ from $\frac{1}{8}$″ to $\frac{1}{4}$″ thick. Write for Folder AD-146.

Garlock 662, 681, and 660 Gasketing materials are another important part of the Garlock 2,000 . . . two thousand styles of packings, gaskets, and seals for every conceivable need. The only complete line. That's why you get unbiased recommendations from your local Garlock representative. Call him today.

Other Underwriters' Approved Gasketing Materials

GARLOCK 681. Vegetable fibre compound with glue binders. Treated with glycerol. For sealing against oils, gasoline, solvents. Withstands moderate pressures and temperatures to 212° F. Sizes from .006″ to ½″ thick in 40″ widths. Write for AD-162.

GARLOCK 660. Granulated cork base with oil-resistant binder. Used where greater compressibility needed for irregular flange surfaces; for application involving low pressures and temperatures to 212° F. Sizes from .010″ to ½″ thick in 36″ widths. Write for AD-162.

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THE GUIDED MISSILE IS A VAST COMPLEXITY OF SYSTEMS FOR GUIDANCE, TELEMETERING, CONTROL, PROPULSION, ETC.

Would you like to know a simple way to build a guided missile?

Sure you would . . . and so would everybody else!

Obviously, there *isn't any simple way* to build a guided missile. And, what's more, there may *never* be one.

But . . .

Research and development people just like yours are proving every day that there *is* a *simpler* way! Constantly, technological improvements are being developed in your own laboratories as well as in laboratories of such organizations as Sciaky.

Sciaky operates the only independent, fully staffed and equipped Research Center dedicated to the development of the resistance welding techniques of fabrication.

That's why the Sciaky Research Center has become a major source to all manufacturers for (1) basic and advanced research, (2) development of experimental tooling and fixturing, (3) assembly of experimental and prototype models, (4) pilot production runs, etc.

Why take less than the full advantage of consulting with Sciaky engineers on your research and development projects. You will receive the full support of (1) the knowledge and experience that has produced almost all the basic technological advances to resistance welding equipment, (2) a complete array of testing and inspection apparatus, and (3) the most unusual collection of the most advanced resistance welding machines of all types, as well as all the other machine shop, fabricating facilities, etc., necessary to a research function of this magnitude.

Write today under your company letterhead for your copy of the facilities brochure describing the Sciaky Research Center in detail. No obligation, of course.

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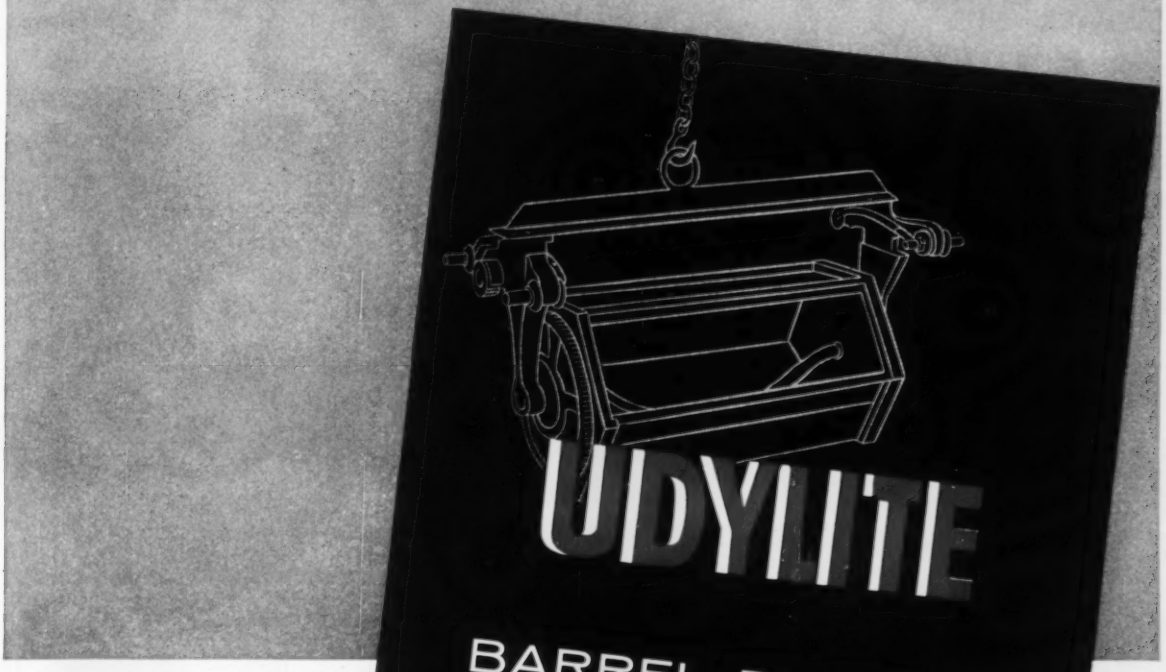
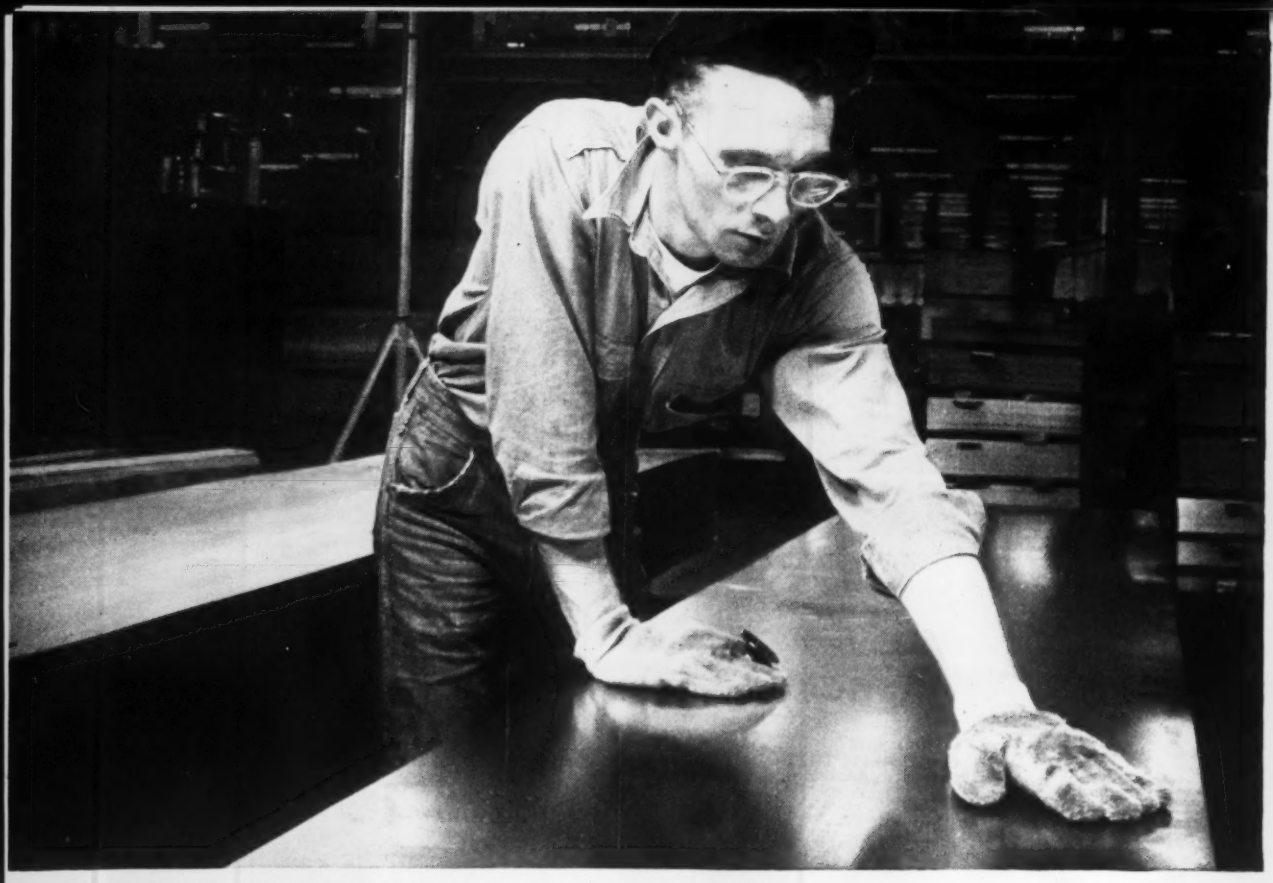
...for faster, more efficient plating!



JUST OFF THE PRESS and ready for you . . . the new Udylite Barrel Plating Bulletin! Whether you now have a barrel plating set-up . . . you are planning on installing one . . . or you just want to keep up with the latest methods of metal finishing, this bulletin provides invaluable ideas for a more profitable, productive plating operation. Loaded with pictures and specifications of up-to-date equipment, this book details what is needed for fast, accurate barrel plating . . . it even shows an ideal barrel plating layout and describes the necessary equipment. Also, it serves as a valuable checklist for keeping your plant well equipped. No modern minded plating shop should be without it. For a free copy contact your local Udylite representative today, or write direct to:

the udylite corporation

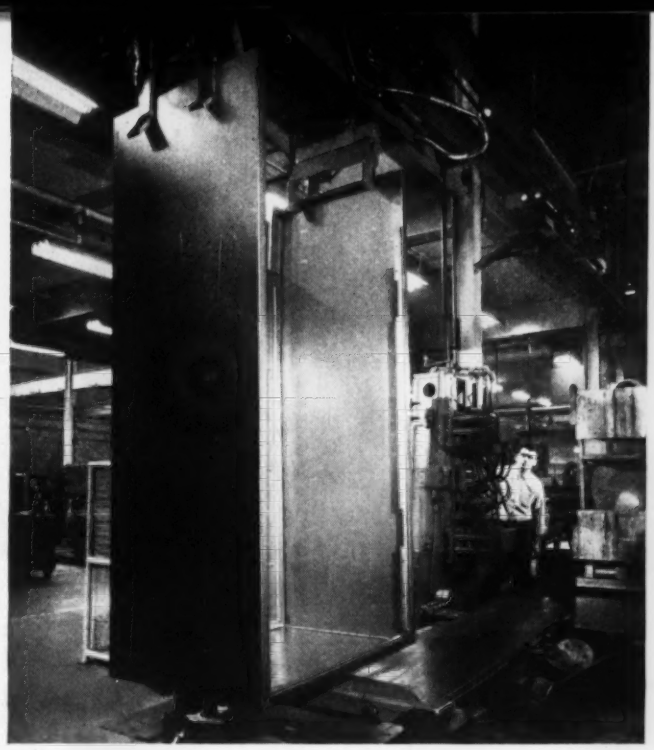
detroit 11, michigan • world's largest plating supplier



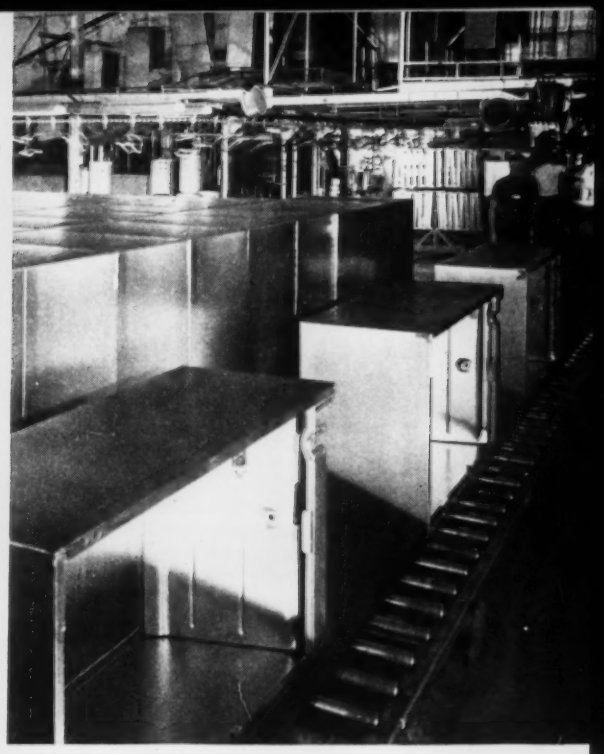
PITTSBURGH STEEL'S cold-rolled sheet passes critical surface inspection as . . .

The 3 F's in Pittsburgh Steel's Sheets Keep Automated Lines Rolling at Westinghouse

STEEL that is free of flaws is vital to the gleaming painted surface of finished refrigerator.



COMPLETELY FORMED by automated equipment, refrigerator's shell then moves to welding operation.



3 F's—Flatness, Finish, Formability—show up here as outer shells await painting.

"If we made 75 a day then, we were really going. Now, we're geared up here to make more than twice that in an hour."

That quote came from a veteran production man at Westinghouse Electric's huge and humming Appliance Division plant near Columbus, Ohio.

The difference between daily production of 75 refrigerators (in 1927) and today's rate is explained by just one word—automation.

Production of the refrigerator's steel shell is automated completely through welding. This includes some 15 distinct operations required to convert smooth, precisely dimensioned cold rolled sheet steel into the outer shell of a home refrigerator.

Part of Westinghouse's ability to use advanced production methods is due to the steel available from suppliers like Pittsburgh Steel Company.

H. L. Johnson, the plant's purchasing agent, and Joseph A. Scattoloni, staff supervisor of manufacturing engineering, agree that automation places special responsibilities on their steel suppliers. As Mr. Scattoloni puts it:

"Westinghouse built its reputation on quality products, but we can't build quality when it isn't in the materials to start with."

Pittsburgh Steel knows—even without automation to consider—that sheet going into appliances must have the Three F's—Flatness, Finish and Formability. Add requirements of automation and you need these same qualities, but more so. Here's why they're so vital.

• **Dimensional accuracy**—A variation of as little as .005 inch could compound into a total error large enough to interrupt production, scrap a shell or both.

To produce a shell, automatic equipment has to make six 90-degree bends, as well as a smaller seventh one. If the sheet isn't flat or if it lacks uniform temper, bends can be thrown off.

Once bends are made, the sheets can't be allowed to spring back. Over-bending, too, will scrap a shell. That gets costly when you consider that the shell—at about 94 pounds—is the largest single item in the 140-150 pounds of steel per finished refrigerator.

If the sheet isn't flat, waviness will show up glaringly in the finished shell, or it could cause an "oil-canning" effect. This poses a threat to the painted surface.

If camber isn't within specific limits, sheets can't be held properly during blanking and punching. Holes creep beyond tolerances, ultimately scrapping the shell.

• **Surface finish**—Since the shell must take a uniform and critical painting, surface finish is all-important.

Rust, scale, piping, pits—singly, or in combination—can ruin a shell, so Pittsburgh Steel knows why flaw-free steel is a must.

• **Formability**—Another name for shapeliness—is more vital in automatic forming than in a hand operation. And strain marks resulting from improperly bent sheet will require either complete scrapping or correction by expensive hand machine methods.

Westinghouse stakes its reputation on quality of its products. A supplier who can provide Westinghouse with this quality can meet your needs, too. The full range of hot-and-cold rolled sheet and strip, produced exactingly on the steel industry's finest mill equipment—is as close as your telephone. Call any of the Pittsburgh Steel Company district sales offices listed here. Do it today!

Pittsburgh Steel Company

Grant Building • Pittsburgh 30, Pa.

District Sales Offices

Atlanta	Cleveland	Dayton	Los Angeles	Pittsburgh
Chicago	Dallas	Detroit	New York	Tulsa
		Houston	Philadelphia	Warren, Ohio

You asked for it . . . .

AND HERE IT IS . . .

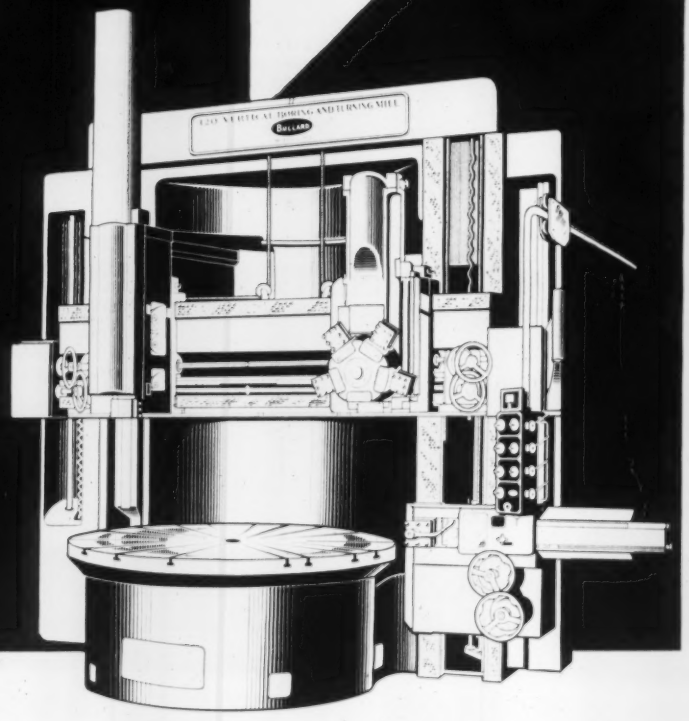
THE NEW

BULLARD 120"

VERTICAL BORING AND TURNING MILL

SWINGS 120" — TABLE SIZE 108"

Recognized for over seventy-five years as the leading builder of vertical turret lathes and boring mills, The Bullard Company has been repeatedly asked to build mills of a larger size incorporating the features of the Model 75 line.



The Bullard 120 Vertical Boring and Turning Mill is designed, engineered and built to meet this customer demand. Feature for feature — by comparison — you'll find it is the outstanding mill on the market today.

BULLARD

REMEMBER . . . to cut costs when cutting metal — Buy BULLARD

Check all the advantages — get the full story by calling your nearest Bullard Sales Office or Distributor.

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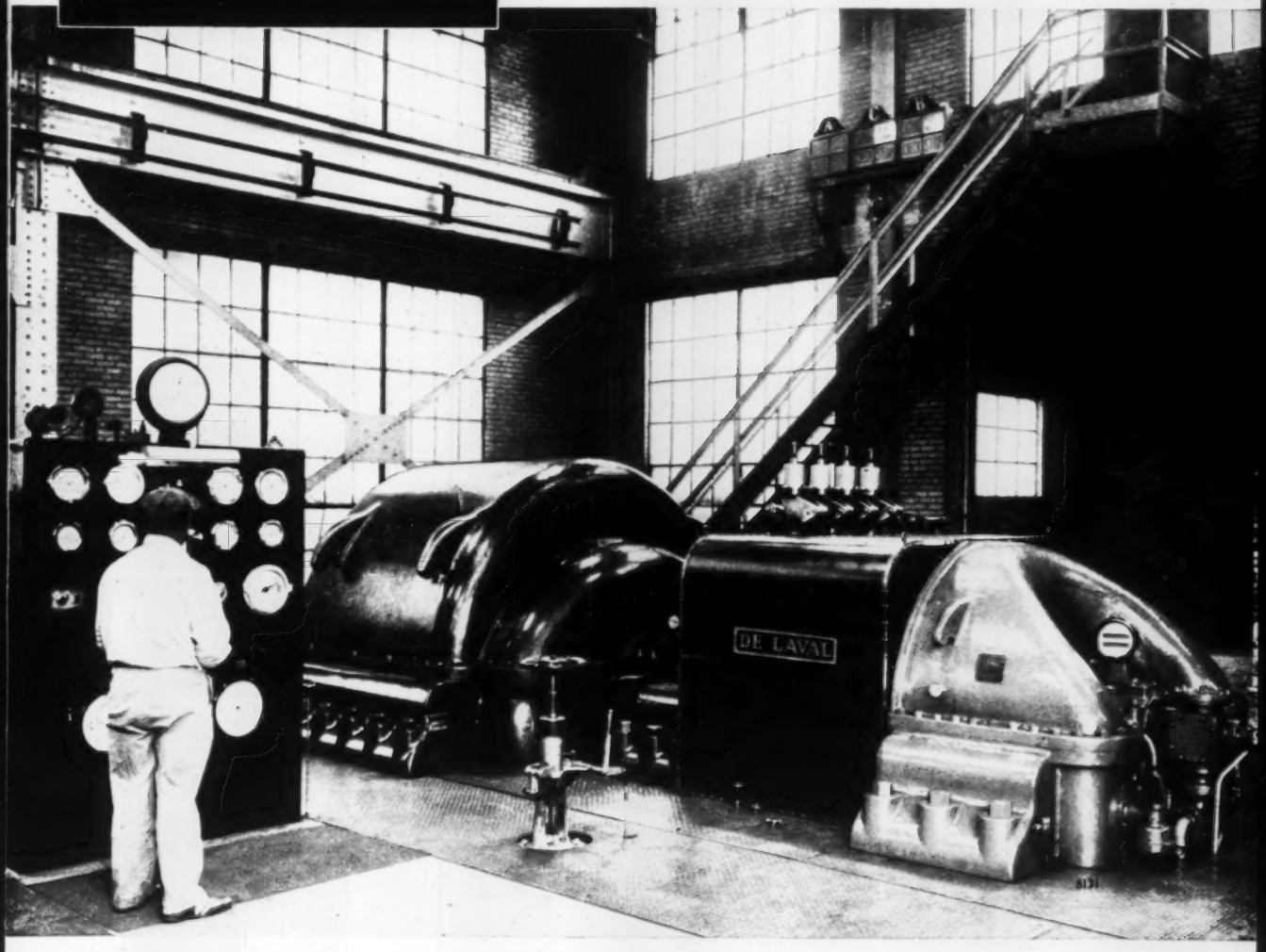
DE LAVAL
BLAST FURNACE BLOWERS

give 20 years of service at Great Lakes Steel Corp.



Shown is one of two De Laval centrifugal blast furnace blowers at the Ecorse, Michigan, plant of the Great Lakes Steel Corporation, Division of National Steel Corporation. This 85,000 cfm unit was installed twenty years ago; another 75,000 cfm unit went on the line a year earlier. Both have given dependable round-the-clock service ever since. These turbine-driven blowers are hooked up to a multi-head which enables either one to be used in conjunction with any of the three blast furnaces.

De Laval centrifugal blowers are built in single and multi-stage types to supply air in volumes up to 150,000 cfm for all classes of service in steel, gas and coke plants. The wealth of application experience acquired by De Laval over the years assures a correct and economical solution to your blower problem.

Send for Bulletin 0504

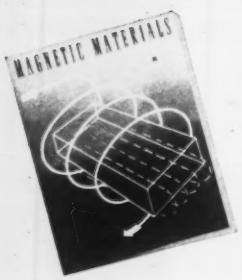
DE LAVAL *Centrifugal Blowers*

DE LAVAL STEAM TURBINE COMPANY
860 Nottingham Way, Trenton 2, New Jersey

DL-389

For your Magnetic Shielding Problems . . .

MUMETAL is the answer!



Write for your copy

"MAGNETIC MATERIALS"

This 32-page book contains valuable data on all Allegheny Ludlum magnetic materials, silicon steels and special electrical alloys. Illustrated in full color, includes essential information on properties, characteristics, applications, etc. Your copy gladly sent free on request.

ADDRESS DEPT. S-7A

Mumetal shields will give instant relief to interference caused by extraneous magnetic fields. This material can cure many troubles—solve many a problem for you.

Use it where high permeability is required at low flux densities, such as in input and microphone transformers, hearing aid diaphragms, instruments, wire and tape recorders, etc. For properly heat treating Mumetal, we can also offer commercial hydrogen annealing facilities.

A fund of technical data on shields and other applications for Allegheny Ludlum Mumetal is available—let us help with your problems.

In addition to Mumetal and other high-permeability alloys, we offer a range of magnetic and electrical alloys and steels that is unmatched in its completeness. Our services also include the most modern facilities for lamination fabrication and heat treatment. • Let us supply your requirements. *Allegheny Ludlum Steel Corporation, Oliver Building, Pittsburgh 22, Pa.*

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WSW 6094

This man is handing you the "Touch of Gold"

This Norton grinding wheel is a money-maker for everybody. Every time it touches the work it adds value . . . provides increased production for management . . . improved earning power for operators . . . better products for the users.

That's why men say Norton grinding wheels have the "Touch of Gold". Norton has more than 200,000 types and sizes of grinding wheels. For every grinding job there is a Norton wheel that will do it best.

Norton representatives help shopmen select that right wheel and are available wherever grinding is done.

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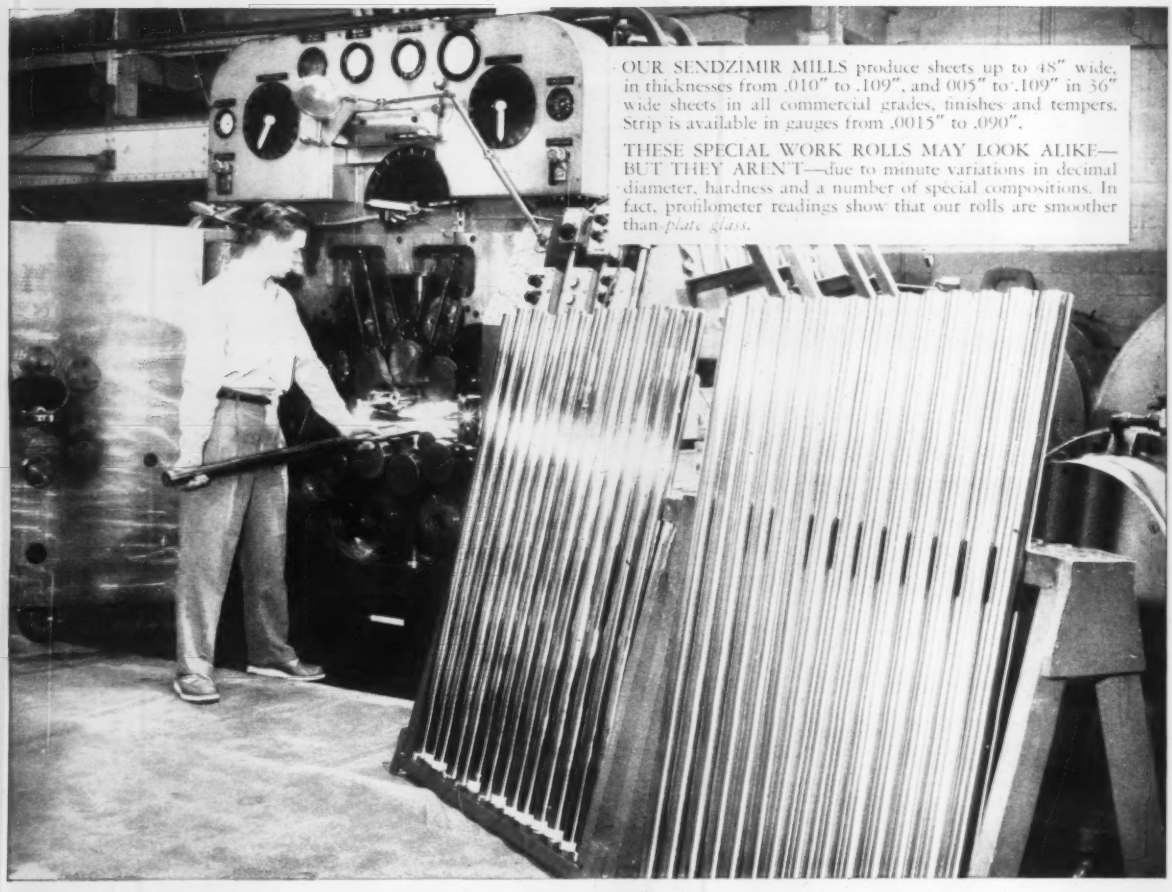
ABRASIVES

Making better products . . . to make your products better



OUR SENDZIMIR MILLS produce sheets up to 48" wide, in thicknesses from .010" to .109", and 005" to .109" in 36" wide sheets in all commercial grades, finishes and tempers. Strip is available in gauges from .0015" to .090".

THESE SPECIAL WORK ROLLS MAY LOOK ALIKE—BUT THEY AREN'T—due to minute variations in decimal diameter, hardness and a number of special compositions. In fact, profilometer readings show that our rolls are smoother than *plate glass*.

It takes more than just a precision mill to produce STAINLESS STEEL *of MicroRold® quality*

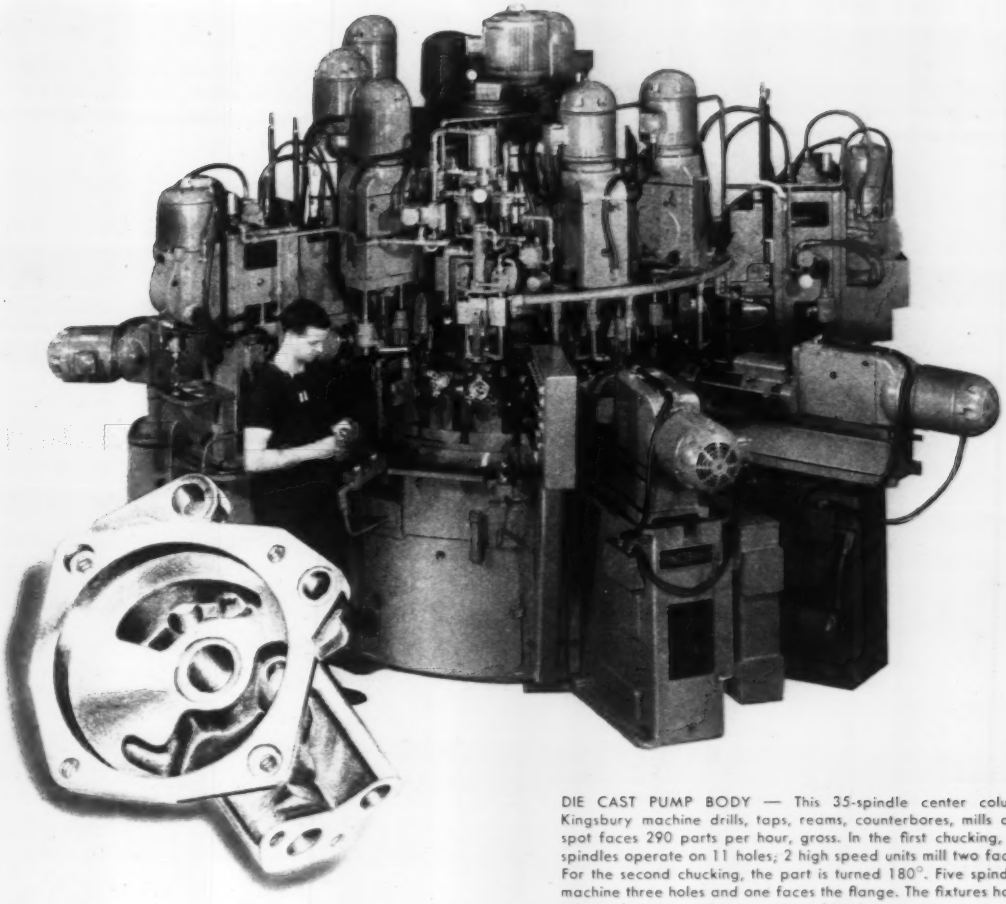
. . . it takes Operating Know-How. Only Washington Steel, first to use Sendzimir sheet rolling, can offer you 10 years of practical experience with these mills.

Every hot-rolled stainless steel band has variations in thickness and surface characteristics which must be compensated for in the cold-reduction process to obtain precise gauge and flawless surfaces. To do this, special work rolls with minute diameter differences along the length of the roll are used in controlling such variations as crown, edge and camber. To accurately control all the possible variations requires a large number of these rolls, plus *highly skilled operators* who know from experience which rolls, speeds and reductions are required. These are but a few of important factors in quality rolling which can only be learned by *long* experience and association with precision mills.

Washington Steel is the only producer whose entire production stainless steel sheet and strip is rolled exclusively on the Sendzimir Mill.

WASHINGTON STEEL CORPORATION

7-0 Woodland Avenue • Washington, Pennsylvania



DIE CAST PUMP BODY — This 35-spindle center column Kingsbury machine drills, taps, reams, counterbores, mills and spot faces 290 parts per hour, gross. In the first chucking, 27 spindles operate on 11 holes; 2 high speed units mill two faces. For the second chucking, the part is turned 180°. Five spindles machine three holes and one faces the flange. The fixtures have power clamping and automatic unclamping.

More Good Parts Per Hour

One indexing automatic is complex, the other fairly simple. Both produce good parts month after month at high production rates. The reasons are good basic design, rugged and accurate construction. This is true of every Kingsbury machine. To be sure the parts will meet your specifications, we run test samples for your approval before we ship the machine.

For 38 years, Kingsbury machines have been used for drilling and tapping operations on parts for the automotive, appliance, office machine, farm and industrial equipment and other industries. Let us quote on your jobs. Kingsbury Machine Tool Corporation, Keene, N.H.

RADIO PART — This Kingsbury performs nine operations on 560 parts per hour, gross. Three horizontal units with two-spindle auxiliary heads drill, countersink and tap two holes; three vertical units countersink, ream and burnish the axial hole.

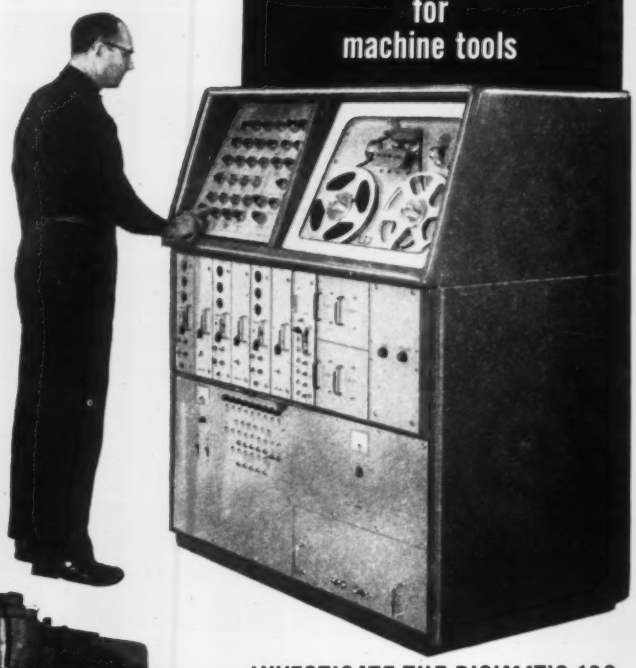
KINGSBURY

INDEXING AUTOMATICS for high production drilling and tapping

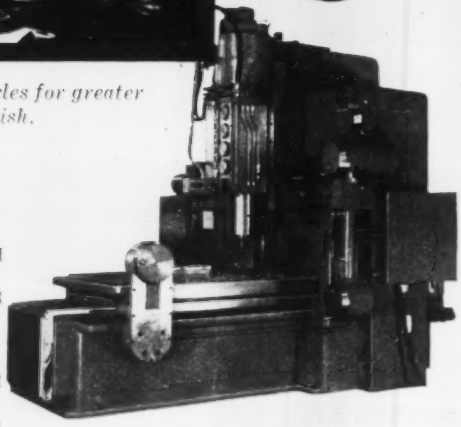
Reduce Costs Increase Efficiency

DIGIMATIC

contour control system for machine tools



EXCLUSIVE! *Cuts true circles for greater accuracy and smoother finish.*



FAST...
- 3½ hours from blueprint to finished piece... for a typical part.
- Director prepares ½" tapes at 8 times cutting rate.

ACCURATE...
- Closed loop servo provides constant check on position.
- Automatic slow-down on inside cuts prevents over-shoots.

ECONOMICAL...
- Lowest cost control system, both in purchase price and in operating expense.
- Keyboard "Programming" by machine shop personnel.
- Eliminates cost, maintenance and storage of "hard" tooling.
- Shortens lead times and reduces first-part cost.

INVESTIGATE THE DIGIMATIC 180 MILLING MACHINE CONTROL!

It's the lowest priced, easiest to operate high-performance contour control system you can purchase today. Commercial deliveries are now being made.

Control illustrated is now in use at Convair-San Diego. This is the first of fifteen DIGIMATIC 180's combined with Morey A50 contour milling machines being delivered to Air Force contractors.

Provides three-axis coordinated control with 100-inches per minute (max.) cutting rate. (±0.001 inch tolerance.) Compact: 48" wide x 35½" deep x 61" high.

DIGIMATIC Controls are now available on a number of well-known machine tools in a variety of sizes.

Write for 16-page, illustrated Brochure giving complete details and specifications.

ECS

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Division of
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Ferromanganese-silicon allows savings of as much as $8 per ton, depending upon practice, in the production of high-manganese stainless steels. It also reduces manganese costs for the chromium-nickel grades of stainless.

The alloy is both an efficient slag reducing agent and the lowest-priced source of low-carbon manganese currently available. For details on cost reductions in your practice, contact your ELECTROMET representative.

ELECTRO METALLURGICAL COMPANY, Division of Union Carbide Corporation, 30 East 42nd Street, New York 17, N. Y.

Ferromanganese-silicon gives lower costs, rapid solubility, and high manganese recoveries.

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Eastern's research, development and production facilities, devoted exclusively to stainless steel in sheets and plates, are available to you through the finest

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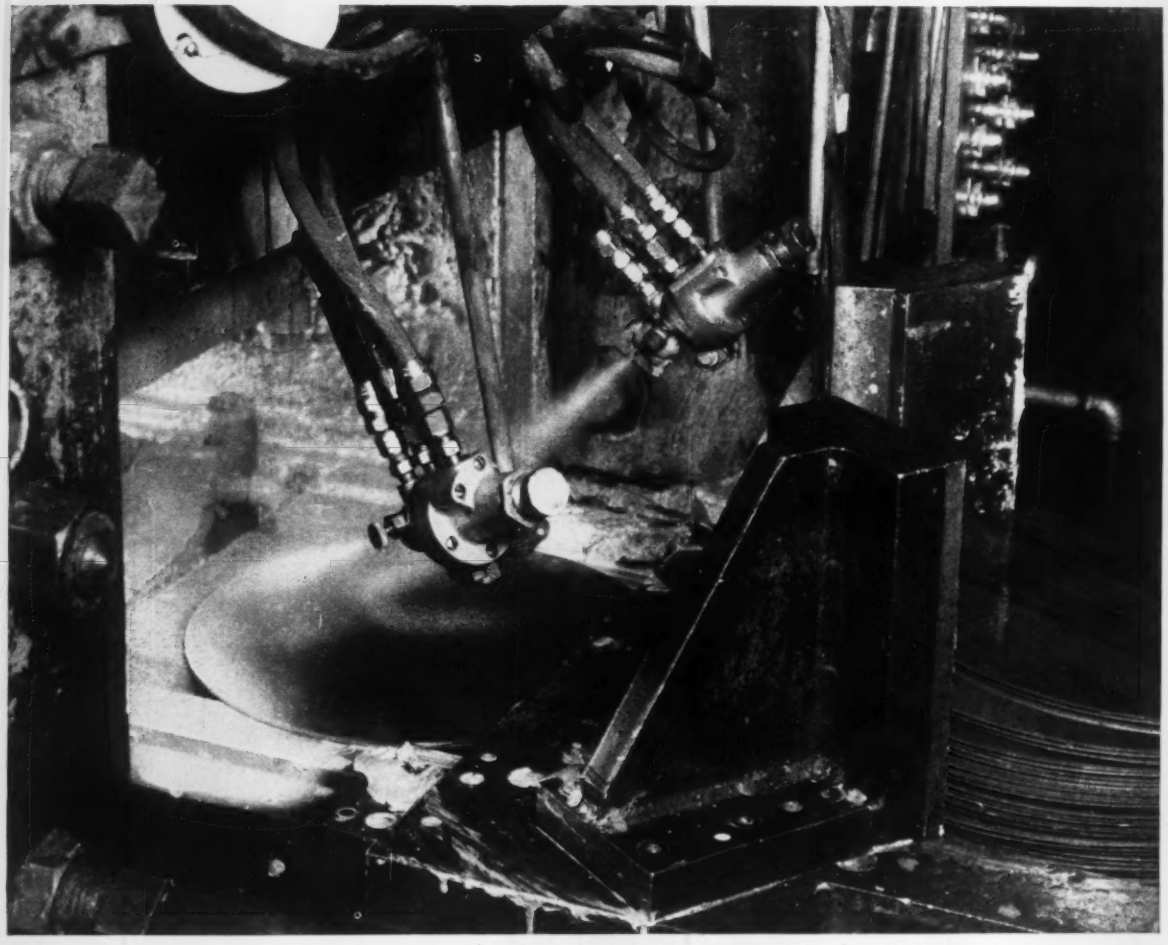
in the whole bright new world of stainless steel.

Your local steel service center offers prompt service, an opportunity to reduce your inventory, and quick delivery of in-stock materials.

ES

Eastern Stainless Steel Corporation • Baltimore 3, Maryland, U.S.A.

ANATOMICAL DRAWING, courtesy of The MacMillan Company, "An Atlas of Human Anatomy" by Carl Toldt, M.D. © 1928



As an automatic feeding device slides another blank into the die, two DeVilbiss WDB Spray Guns apply a measured amount of lubricant—saving material, protecting dies, reducing rejects.

THESE SPRAY GUNS ARE SAVING $18,000 ANNUALLY!

"Applying die lubricants by the DeVilbiss Spray Method has cut our costs for compound, application, and press maintenance *in half*," reports the procurement engineer for one of the nation's largest refrigerator manufacturers. "What's more, malformed and broken parts have been practically eliminated.

"We are currently using the spray method on two 350-ton presses that form the housings for our rotary compressors. Originally, an extra man was required at each press to swab the compound by hand. We also tried dripping lubricant on rollers which transferred it to the stock. Both of these methods proved slow and wasteful with a high number of rejects.

"Now, by spraying the compound on the blanks automatically with two DeVilbiss WDB Guns, we get the *right* amount of lubricant in the *right* places. The result is a saving in material, fewer rejected parts, and fewer interruptions to remove 'breakouts' from the die. Downtime for press cleanup has also been substantially reduced."

If your manufacturing process involves the application of die lubricants, it will pay you to check the advantages of the DeVilbiss Spray Method. Call our nearest branch office for full details, or write: The DeVilbiss Company, Toledo 1, Ohio.

THE DEVILBISS COMPANY
Toledo 1, Ohio
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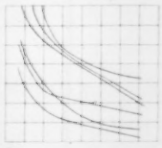
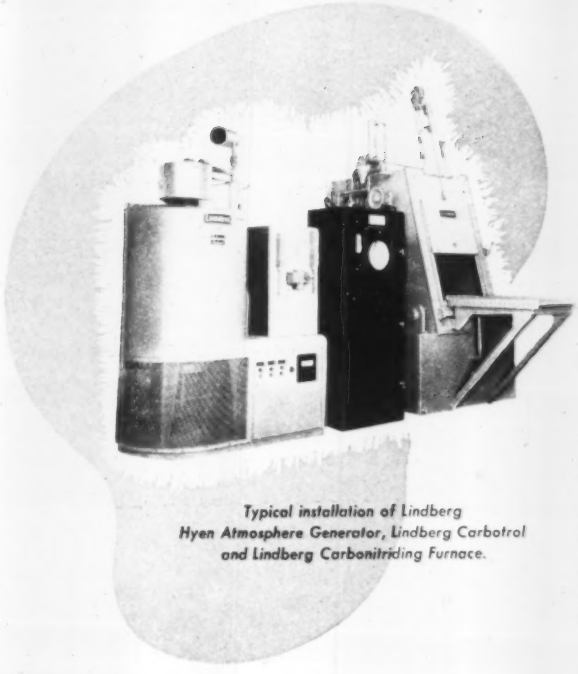
FOR BETTER SERVICE, BUY
DEVILBISS

What every good metal man should know about CARBONITRIDING

First of all, it is a good idea to know what equipment will do the best carbonitriding job for your specific requirement. And the best way to find this out is to talk over your problems with the people who have consistently developed the methods and equipment for better, more dependable, more economical carbonitriding results. That would be Lindberg.

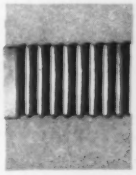


Let's look at the record. Lindberg's contributions to carbonitriding and carburizing go far beyond just the building of furnaces to do it. It covers the development of controlled atmosphere generators, the creation of dew point equilibrium curves to establish proper atmosphere values for type of steel and temperatures involved and the exclusive Lindberg Carbotrol to maintain these values automatically in production.



Typical installation of Lindberg Hyen Atmosphere Generator, Lindberg Carbotrol and Lindberg Carbonitriding Furnace.

Then there is the invention of the "dimple" vertical radiant tube which gave new efficiency and economy to fuel-fired atmosphere furnaces. Lindberg's exclusive CORRTHERM electric heating element made practical the use of electricity in atmosphere furnaces.



Add to this our record over the years of building a broad variety of carbonitriding and carburizing furnaces, big ones, small ones, manuals, automatics, fuel-fired, electric, and it seems it's just good common sense to bring your heat treating problems to us. Just get in touch with the Lindberg Field Representative in your locality or write:

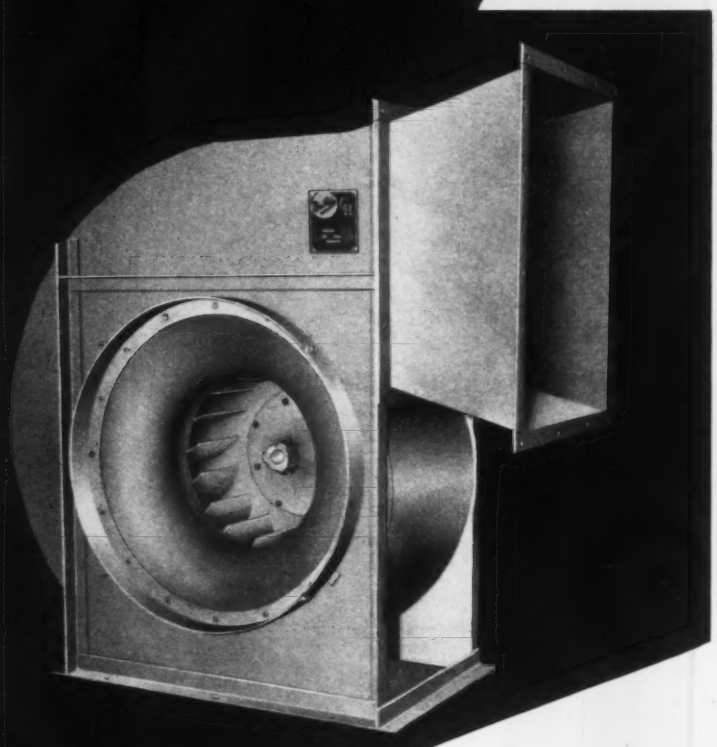
LINDBERG ENGINEERING COMPANY

2441 West Hubbard St., Chicago 12, Illinois

Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.

LINDBERG

heat for industry



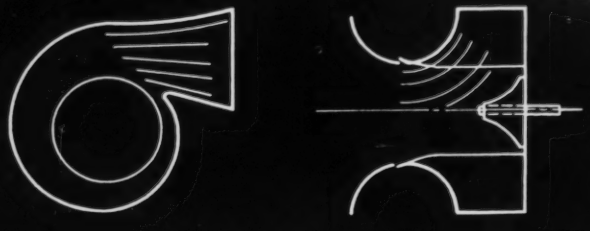
"Buffalo" Type "CR" Radial Blade Fan

DESIGNED FOR PERFORMANCE UNDER DEMANDING CONDITIONS

Widely-used in rugged steel mill applications, the "Buffalo" Type "CR" Radial Blade Fan is unsurpassed for dependable and long-lasting service under the most severe industrial conditions.

The "CR" is unique in the fact that the same design principles which reduce wear actually increase the efficiency of these husky fans. An engineering refinement of the radial blade principle — plus a new high in streamlining the entire fan, from inlet through wheel to outlet — boosts performance at the same time that it cuts down wear. (See drawings at left.)

Add to these wear-resistant **design principles** the long-standing "Buffalo" tradition of heavy-duty reliable **construction features**, and you have an unbeatable combination of factors contributing to maximum efficiency and minimum wear.



Streamlined housing and gradually diverging outlet not only increase static efficiency, but reduce housing wear because of minimum turbulence.

Mating sections of the inlet and wheel flange form a true-half-circle. Resultant smooth air flow further reduces wear and provides peak performance.

Investigate this high performance fan, designed for severe industrial service. Ask your nearby "Buffalo" Engineering Representative for full details on the "CR", or write for Bulletin FD-205.

Every "Buffalo" Fan features the famous "Q" Factor — the built-in QUALITY that provides trouble-free satisfaction and long life.

BUFFALO FORGE COMPANY

"Buffalo"

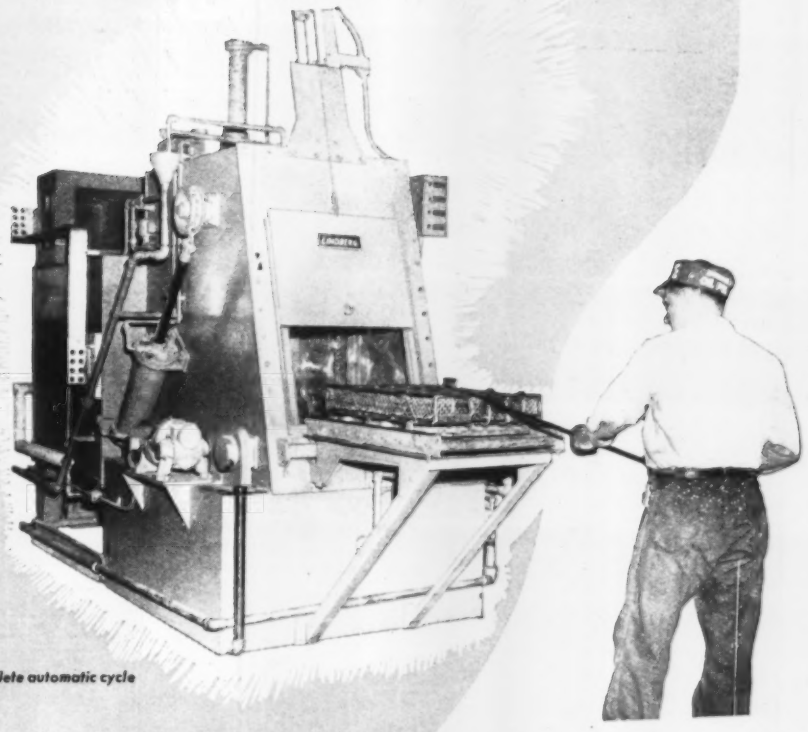
BUFFALO, N. Y.

Buffalo Pumps Division, Buffalo, N.Y. • Canadian Blower & Forge Co., Ltd., Kitchener, Ont.

VENTILATING • AIR CLEANING • AIR TEMPERING • INDUCED DRAFT • EXHAUSTING • FORCED DRAFT • COOLING • HEATING • PRESSURE BLOWING

Here's the work-horse

for many a carbonitriding job



This furnace has complete automatic cycle and quench control.

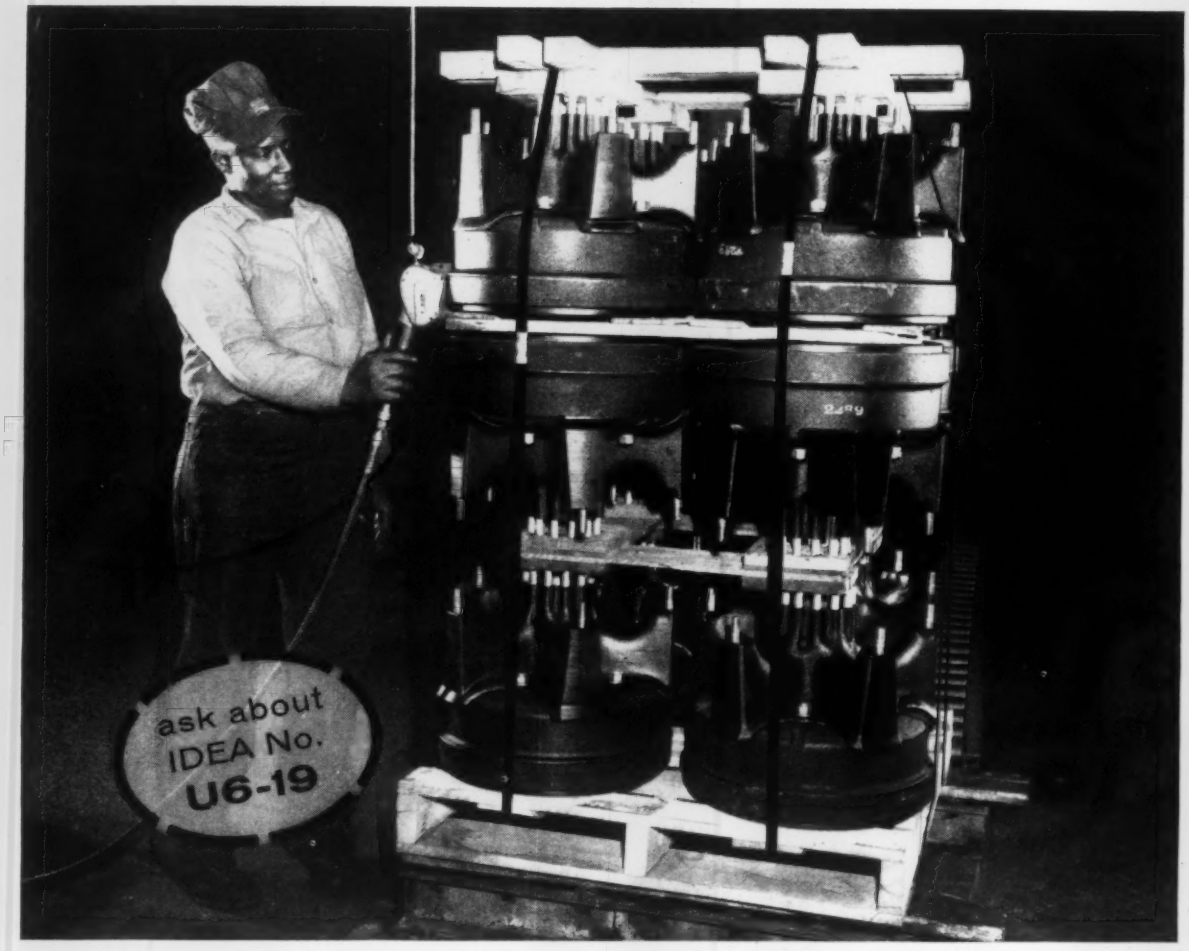
This is the most widely-used carbonitriding furnace of all. Day in and **day out production of** tons and tons of work has proved this furnace's **ability to increase** production quality and volume and reduce costs. It **is a versatile** furnace, too, not only for carbonitriding but for other uses, **carburizing**, annealing, carbon restoration and many hardening applications.

This type of furnace is available for both manual and automatic operation. It can be equipped either with Lindberg's efficient new vertical radiant tubes for fuel-firing or for electric heating with Lindberg's revolutionary new CORRTHERM element.

Versatile as this furnace is, we don't claim it is the best solution to *every* carbonitriding problem. But, whatever your need may be, talk it over with Lindberg. Our engineers, as they have done in so many instances, will recommend a sound answer—design it, build it, even field-install it if you wish. Just get in touch with the Lindberg plant or the Lindberg Field Representative in your locality. Lindberg Engineering Company, 2441 West Hubbard St., Chicago 12, Illinois. Los Angeles Plant: 11937 S. Regentview Ave., at Downey, California.

LINDBERG

heat for industry



See your AIM*. . . Gunite Foundries does . . .

Acme Steel Strapping unitizes vehicle parts

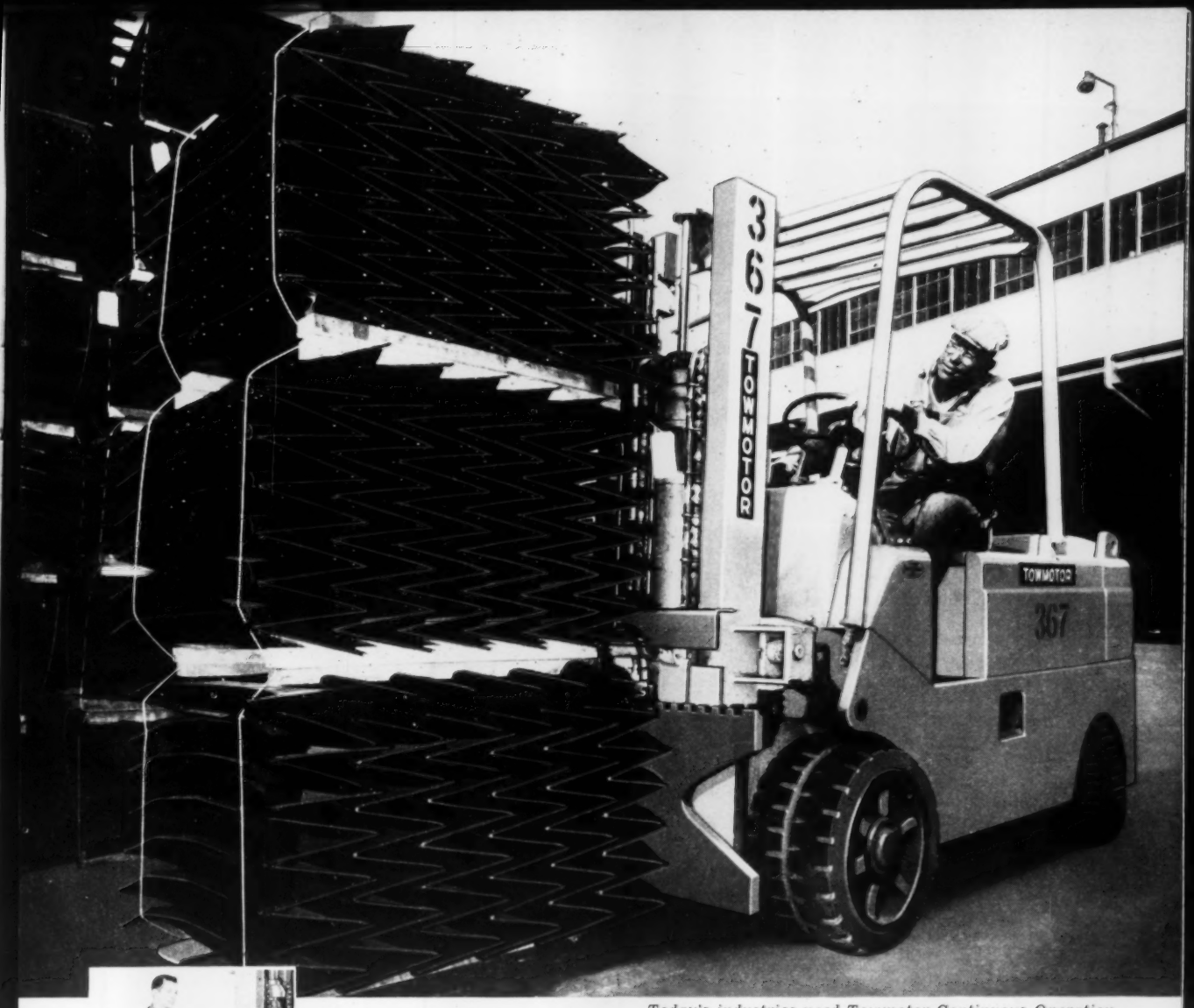
GUNITE FOUNDRIES CORPORATION, ROCKFORD, ILL., found a way to improve arrival condition of precision vehicle parts. Together with their Acme Idea Man they worked out highly successful unitizing and palletizing methods, using heavy-duty Acme Steel Strapping tensioned with pneumatic tools. (Idea No. U6-19)

Acme Idea Man W. C. Saari solves strapping problems for Gunite Foundries and many other companies.

Example: Wheel and brake assemblies are unitized on pallets, and kept secure and stable in transit and during transfer between carriers, arriving at destination without damage. Both manufacturer and customer profit from maximum utilization of mechanical handling equipment. Additional time and effort are saved by Gunite through use of an Acme Steel Pneumatic Stretcher. Delivering a pre-determined tension, this tool takes strapping direct from the coil, eliminates waste and contributes to increased package output by reducing operator fatigue.

***See your Acme Idea Man** about your packaging problems. His solutions can result in safe arrival of your products, as well as savings in time and materials. Call him, at the Acme Steel office nearest you, or write Dept. SDU-78, Acme Steel Products Division, Acme Steel Company, Chicago 27, Illinois. In Canada, Acme Steel Company of Canada, Ltd., 743 Warden Ave., Toronto 13, Ontario.

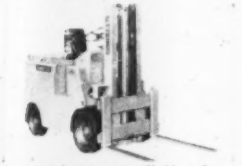
ACME STEEL **STEEL STRAPPING**



Today's industries need Towmotor Continuous Operation

Easy on muscles! Towmotor Improved Power Steering triples driving ease; Towmotor TowmoTorque Drive adds cushioned "creep control" unequalled in the industry.

Get under hood fast! Towmotor tilt-back seat and slip-socketed panels permit 23-second access to entire engine and parts without tools . . . a mechanic's dream!



Low up-keep assured! New functional-design construction introduced in Towmotor "Pace-Maker" Series adds extra economy to Towmotor Continuous Operation. Model 540 shown.

It's a New Towmotor "Pace-Maker"...built to last!

The stamina of this "Pace-Maker" Series Fork Lift Truck will hardly surprise you—it looks like it's built for more rough-and-tumble treatment than you'll ever give it, and it is.

But slip into the driver's seat and you'll marvel. Towmotor TowmoTorque Drive makes this compact lift truck handle 5½-ton loads with unmatched ease! Operator "inches" gently up to tier—or skims over any terrain—with minimum effort. Saves extra maintenance dollars all the while.

Send for Towmotor Booklet SP-23 or ask for a convincing demonstration—or do both.

Leaders for 39 years in building Fork Lift Trucks, Tractors and Carriers

TOWMOTOR — THE ONE-MAN-GANG® — **-GERLINGER**

Gerlinger Carrier Co. is a subsidiary of Towmotor Corporation, Cleveland 10, Ohio

☐ Send free Towmotor Booklet SP-23

☐ Send free Certified Job Studies relating to our business, which is:

Name_____

Company_____

Address_____

Mail to **TOWMOTOR CORPORATION,** Cleveland 10, Ohio

Designing that special drive you need is second nature to Farrel engineers

Pictured are gear drives specially designed by Farrel for two of the company's own products. Both are "specials" engineered to meet customers' requirements for these applications.

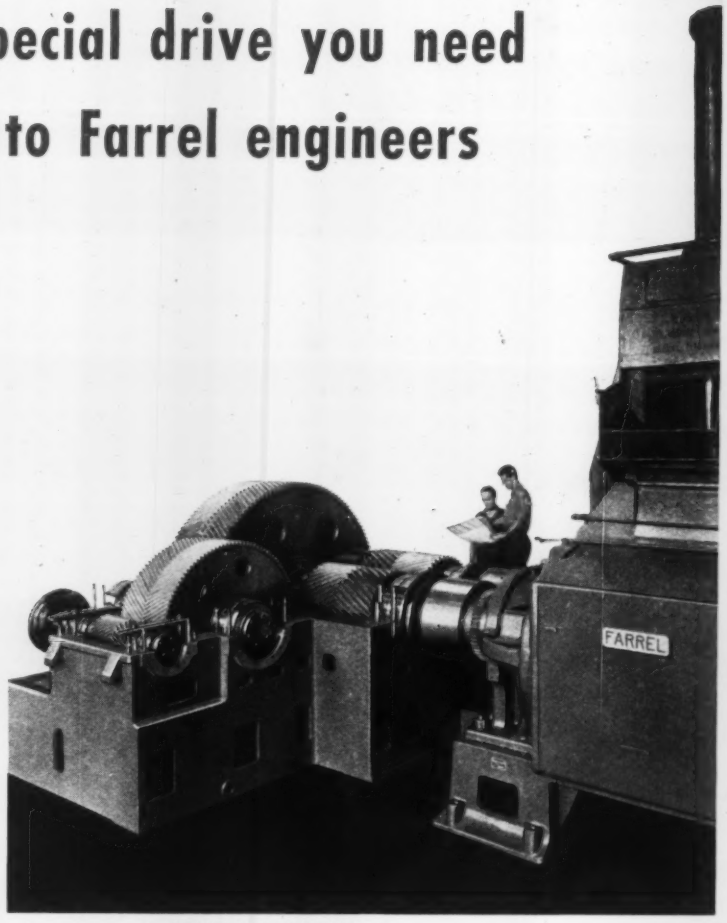
This kind of experience — year in and year out — qualifies Farrel engineers to design the "special" you may need; or perhaps the drive that will exactly suit your requirements is already among the hundreds and hundreds of units which have been developed by the company for use in the rubber, plastics, paper, sugar, marine and metalworking industries. The possibility is worth investigating.

The company's Buffalo plant has specialized for many years in the manufacture of gears, gear units and gear-generating machines. This specialization, coupled with the broad knowledge of industry requirements, is a hard combination to beat when you need a "special" gear drive.

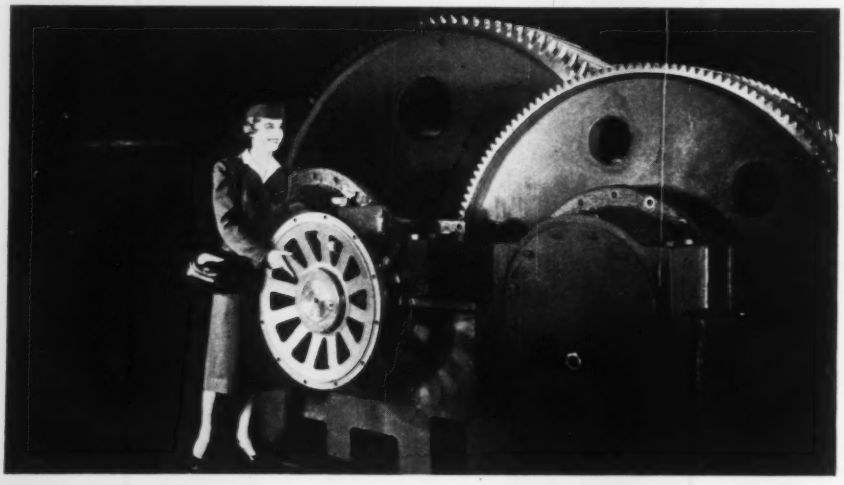
Send for descriptive bulletins of Farrel gear units.

FARREL-BIRMINGHAM COMPANY, INC.
ANSONIA, CONNECTICUT
Plants: Ansonia and Derby, Conn., Buffalo and Rochester, N. Y.
Sales Offices: Ansonia, Buffalo, Boston, Akron, Ann Arbor (Mich.), Chicago, Minneapolis, Los Angeles, Salt Lake City, Tulsa, Houston, Baton Rouge, Fayetteville (N.C.).
European Office: Piazza della Republica 32, Milano, Italy

Farrel-Birmingham

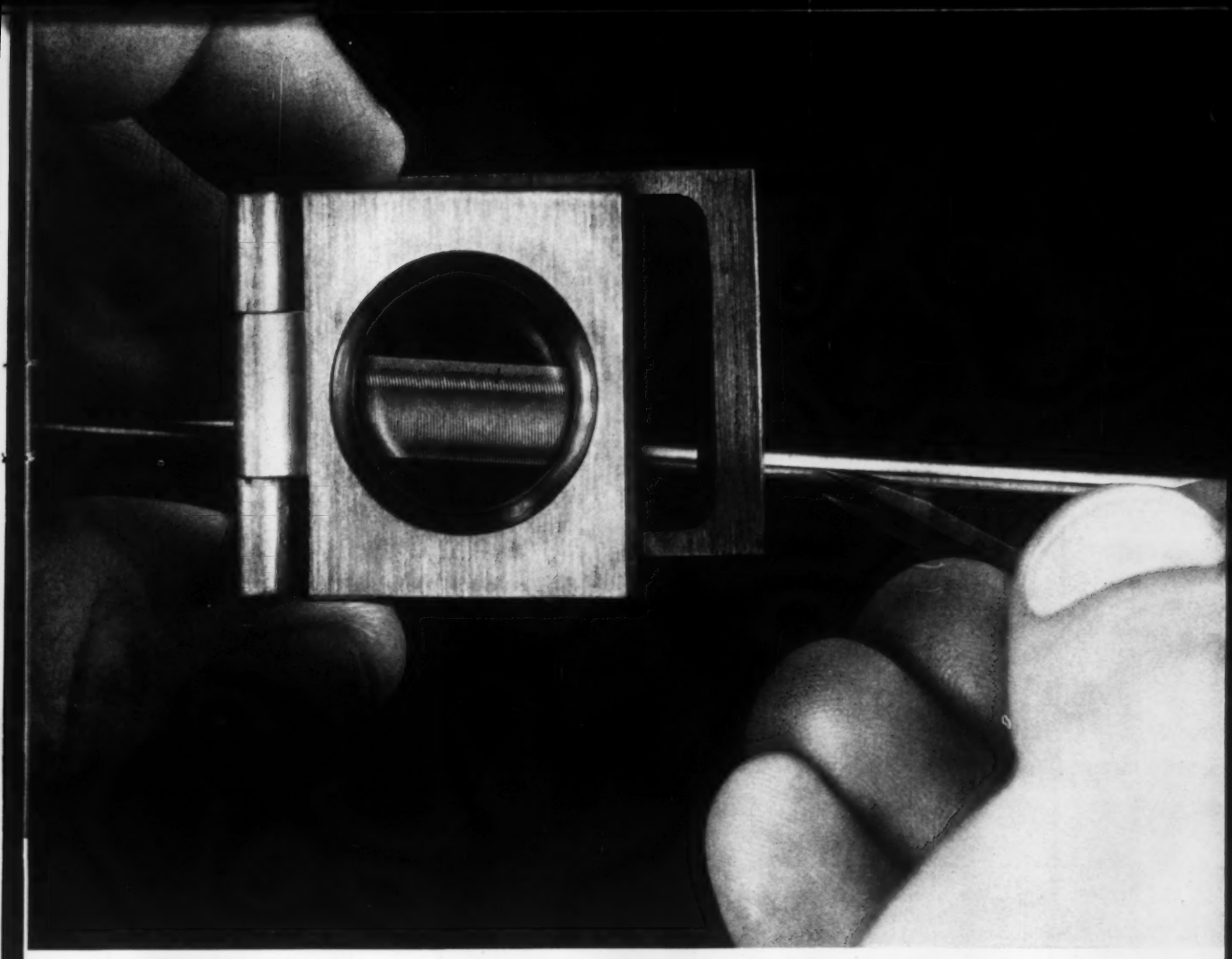


2250 HP UNI-DRIVE
largest drive ever applied to a Banbury® mixer. Gears are generated by the Farrel-Sykes method — a process that assures accuracy of tooth spacing, profile and helix angle.



DOUBLE-REDUCTION GEAR UNIT
one of six specially designed for driving a six-mill tandem for grinding sugar cane. The girl is turning the drive by hand to illustrate the fine precision and balance of the huge double-helical gears mounted on antifriction roller bearings.

FB-1133



How "high fidelity" in music spring wire licks a big production problem

Leading producers of carbon paper apply the carbon coating by means of steel rods closely wound with hair-fine music wire. The wire-to-wire valleys, as determined by wire diameter, control the amount of carbon deposited.

Here is a case where product quality and smooth, uninterrupted production are both dependent on extreme uniformity in the fine wire being used—extreme uniformity in diameter, finish and temper.

This super-critical wire is produced by the Worcester Wire Works Division of National-Standard. Because it does the best job by production comparison, it's naturally preferred. Keep this in mind and check with the Worcester Wire Works Division on your next need for fine wire if quality control is at all a factor. You'll get the finest of *service*, too!

NATIONAL NS NATIONAL STANDARD Company **STANDARD**

DIVISIONS: NATIONAL-STANDARD, Niles, Mich.: *fine wire, stainless, music spring and plated wires* • WORCESTER WIRE WORKS, Worcester, Mass.: *music spring, stainless and plated wires, high and low carbon specialties*
WAGNER LITHO MACHINERY, Secaucus, N. J.: *metal decorating equipment* • ATHENIA STEEL, Clifton, N. J.: *flat, high carbon spring steels* • REYNOLDS WIRE, Dixon, Ill.: *industrial wire cloth*

Ski lift operators stress safety when it comes to buying wire rope. Too many lives are at stake. So they buy . . .

A Safe Lift

Even though you don't operate a ski lift, false economy can be costly in your rope purchases, too. For a rope failure can cause personal injury . . . wreck your equipment . . . throw off your entire work schedule . . . and affect employee morale. Yes, a "bargain" wire rope may save you money, yet cost you your peace of mind. Don't take a chance. Buy a rope that's a quality rope—buy Wickwire Rope.

CF&I

WICKWIRE ROPE
A CF&I PRODUCT

LOOK FOR THE YELLOW TRIANGLE

PRODUCT OF WICKWIRE SPENCER STEEL DIVISION
THE COLORADO FUEL AND IRON CORPORATION

5050

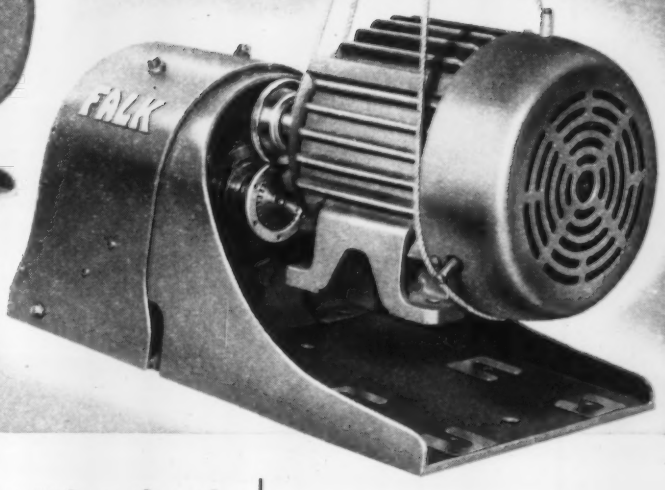
THE COLORADO FUEL AND IRON CORPORATION — Denver • Houston • Odessa (Tex.) • Phoenix • Salt Lake City • Tulsa
PACIFIC COAST DIVISION—Los Angeles • Oakland • Portland • San Francisco • Seattle • Spokane
WICKWIRE SPENCER STEEL DIVISION — Boston • Buffalo • Chattanooga • Chicago • Detroit • Emlenton (Pa.) • New Orleans
New York • Philadelphia

Change motors in minutes—

with FALK all-steel MOTOREDUCERS

OUT COMES OLD MOTOR ⬆

IN GOES REPLACEMENT MOTOR ➡



No long and costly "down time" involved

Motors can be interchanged or replaced *in minutes* with the all-steel, All-Motor type FALK Motoreducer. No long and costly "down time" is involved in making the change!

Best of all, replacement is not limited to original make of motor—new NEMA frames may be substituted for old. This versatile Motoreducer operates with any make, speed or type of standard foot-mounted motor within its AGMA rating. No modification, no special shaft, no "partial" motor required.

In addition to unmatched motor interchangeability, this dependable gear drive—the "work horse of industry"—offers: widest choice of output-shaft position (horizontal, vertical, right-angle)...any output-shaft connection...any mounting, including wall and ceiling...standard speed range from 1.5 rpm to 1430 rpm. All these advantages, plus proved efficiency, low maintenance and extra-long life, make the All-Motor type FALK Motoreducer your best buy for any job requirement.

Furnished in sizes up to 75 hp with any make, style or type of motor; or, *without a motor if desired.* FALK Motoreducers are available from convenient factory, field or distributor stocks, from coast to coast.

Write for Bulletin 3100

THE FALK CORPORATION, MILWAUKEE, WISCONSIN

MANUFACTURERS OF:

- Motoreducers
- Speed Reducers
- Flexible Couplings
- Shaft Mounted Drives
- High Speed Drives
- Special Gear Drives
- Single Helical Gears
- Herringbone Gears
- Marine Drives
- Steel Castings
- Weldments
- Contract Machining

FALK

...a good name in industry

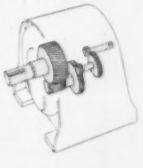
FALK "IN-BUILT" FACTORS assure full dependability—better service—longer life

ALL-STEEL HOUSINGS

Rugged, strong, rigid ...all parts heavy steel plate, formed and welded in the Falk Weld Shop.

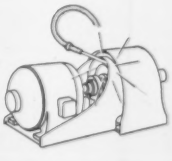
LARGE OVERHUNG LOAD CAPACITY

Large shafts, oversize bearings...rigid mountings with wide bearing spans to handle maximum loads.



PRECISION GEARING

Heat-treated alloy steel gearing, precision cut and shaved after heat treatment to eliminate distortion.

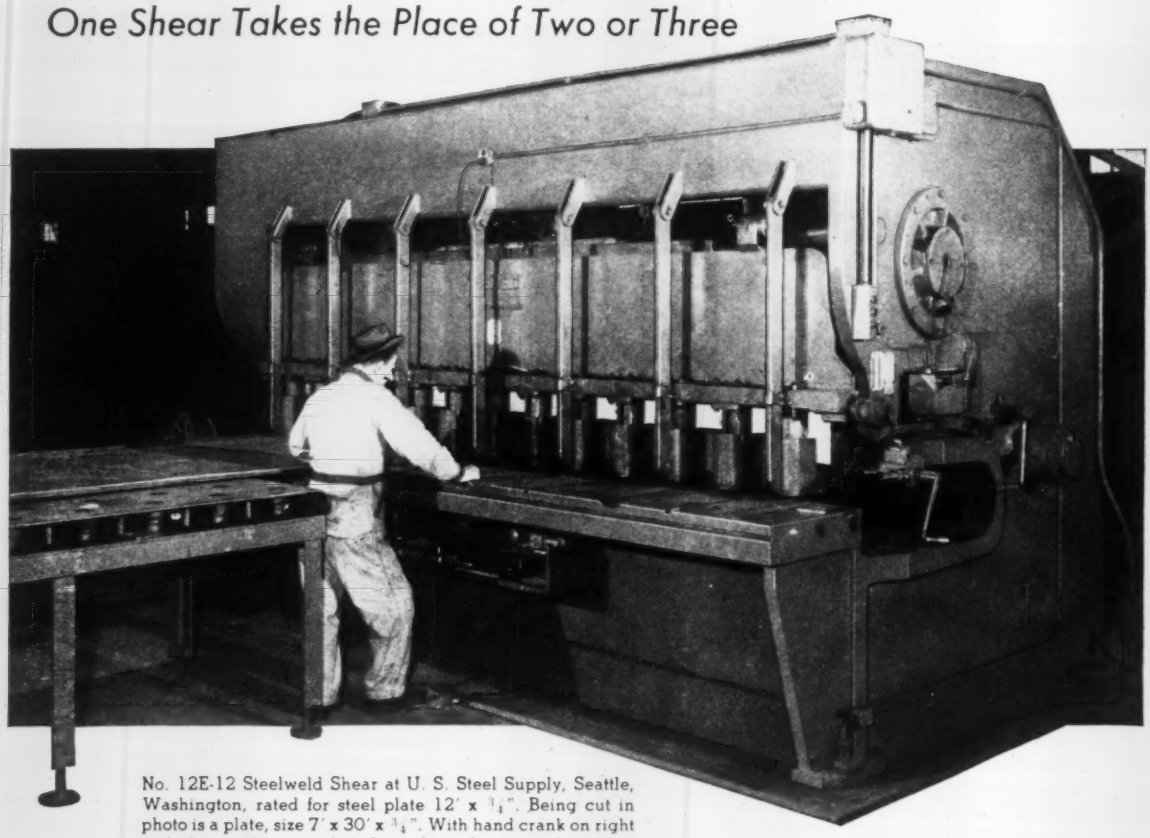


SEALED HOUSINGS

Splashproof, dustproof, oiltight. Dual closures and one-way vents keep oil in, dust and moisture out.

U. S. Steel Supply Provides Customers with **SMOOTH ACCURATE SHEARING**

One Shear Takes the Place of Two or Three



No. 12E-12 Steelweld Shear at U. S. Steel Supply, Seattle, Washington, rated for steel plate 12′ x ¾″. Being cut in photo is a plate, size 7′ x 30′ x ¾″. With hand crank on right end, this machine can be adjusted in a few seconds to have exactly the right knife clearance to obtain the finest cut for any thickness. To make this adjustment on guillotine-type shears usually requires several hours.

MANY steel warehouses have two and often three shears, one of a ¼″ capacity for lighter thicknesses, another of ½″ capacity for cutting ¼″ to ½″ material, and a third with 1″ capacity for thicknesses over ½″ and up to 1″. At some of its warehouses, U. S. Steel Supply uses only one machine for cutting the various thicknesses—a Steelweld Pivoted-Blade Shear.

One machine takes the place of two or three, because it is so easy to adjust the knife clearance required to obtain the best cuts for different thicknesses, which can range from lightest gauge metal to the heaviest plate within the capacity of the shear.

Thus, the investment in shearing equipment is kept low, yet the customers of U. S. Steel Supply are always assured of straight, smooth, accurately cut metal on every order.

GET THIS BOOK!

CATALOG No. 2011 gives construction and engineering details. Profusely illustrated.

THE CLEVELAND CRANE & ENGINEERING CO.

7853 EAST 282ND STREET, WICKLIFFE, OHIO

STEELWELD PIVOTED BLADE SHEARS

Consistent Quality Has Benefits for You

The reputation of Roebling high carbon flat spring steel is based on two uncompromising facts: its unexcelled dimensional and mechanical uniformity.

They are qualities that contribute immediately and directly to *your* increased production rates and decreased rejects.

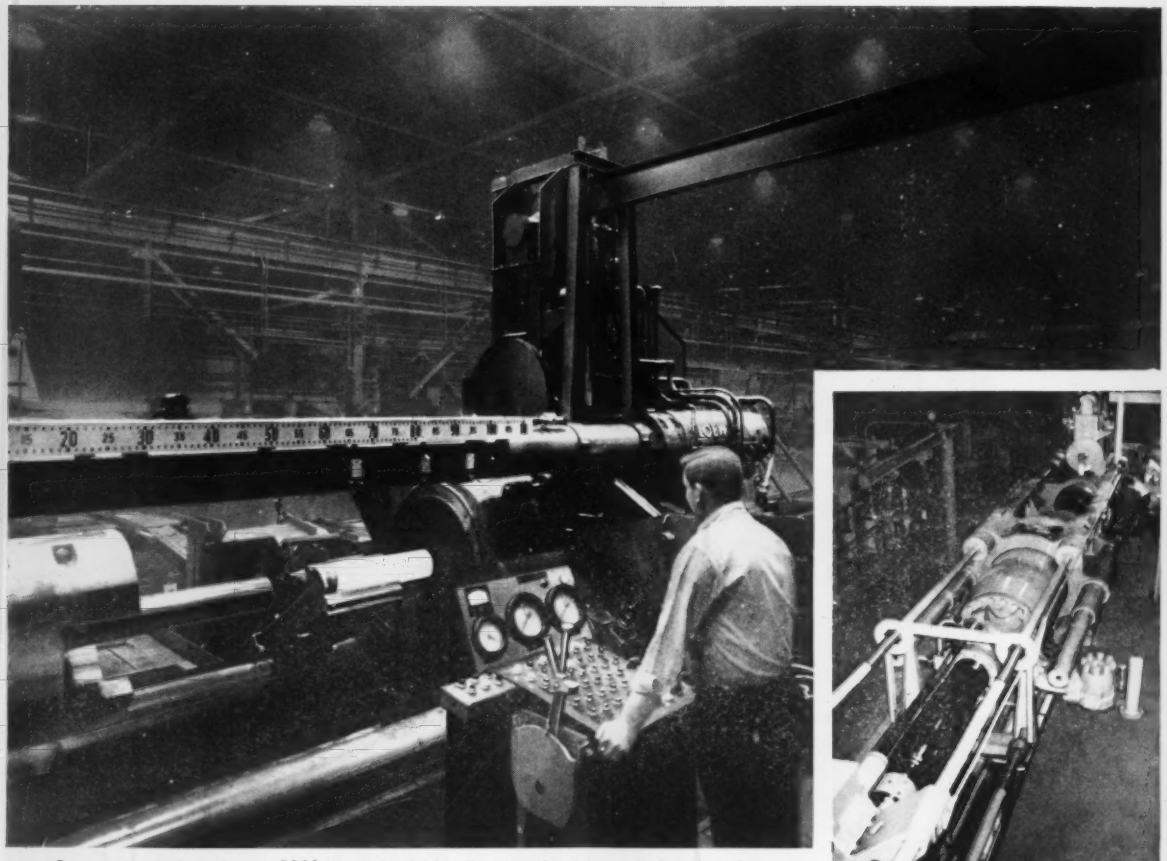
You are taking advantage of a collection of benefits when you specify Roebling. Write Wire and Cold Rolled Steel Products Division, John A. Roebling's Sons Corporation, Trenton 2, New Jersey.

Roebling high carbon flat spring steel is used for a wide variety of parts.

ROEBLING

Branch Offices in Principal Cities · Subsidiary of The Colorado Fuel and Iron Corporation

Roebling... Your Product is Better for it



Operator's station at new 3000-ton water-hydraulic extrusion press designed and built by Loewy-Hydropress for American Brass Company's new Los Angeles plant.

Overhead view of new 3000-ton Loewy extrusion press.

At American Brass Company, Los Angeles . . . new high-speed 3000-ton Loewy extrusion press

A new 3000-ton water-hydraulic extrusion press at the Los Angeles plant of American Brass Company now swells to six the number of Loewys in operation this year at this firm's plants throughout the country. Designed for the high-speed production of brass and copper extrusions—tubes of high concentricity, rods, sections and wire rod—this press is fitted with an independent external piercer and extrudes billets up to 32 in. long and 10 in. in diameter.

Many auxiliary operations within the press are performed by highly mechanized devices which reduce the number of personnel to a minimum: a special lateral die slide device, automatic billet handling, automatic dummy and cleanout disc cycle, pushbutton die changing, fast container changing system, mechanized runout table and means for removing extrusions from the table to the cutoff saw and beyond it to the cooling beds.

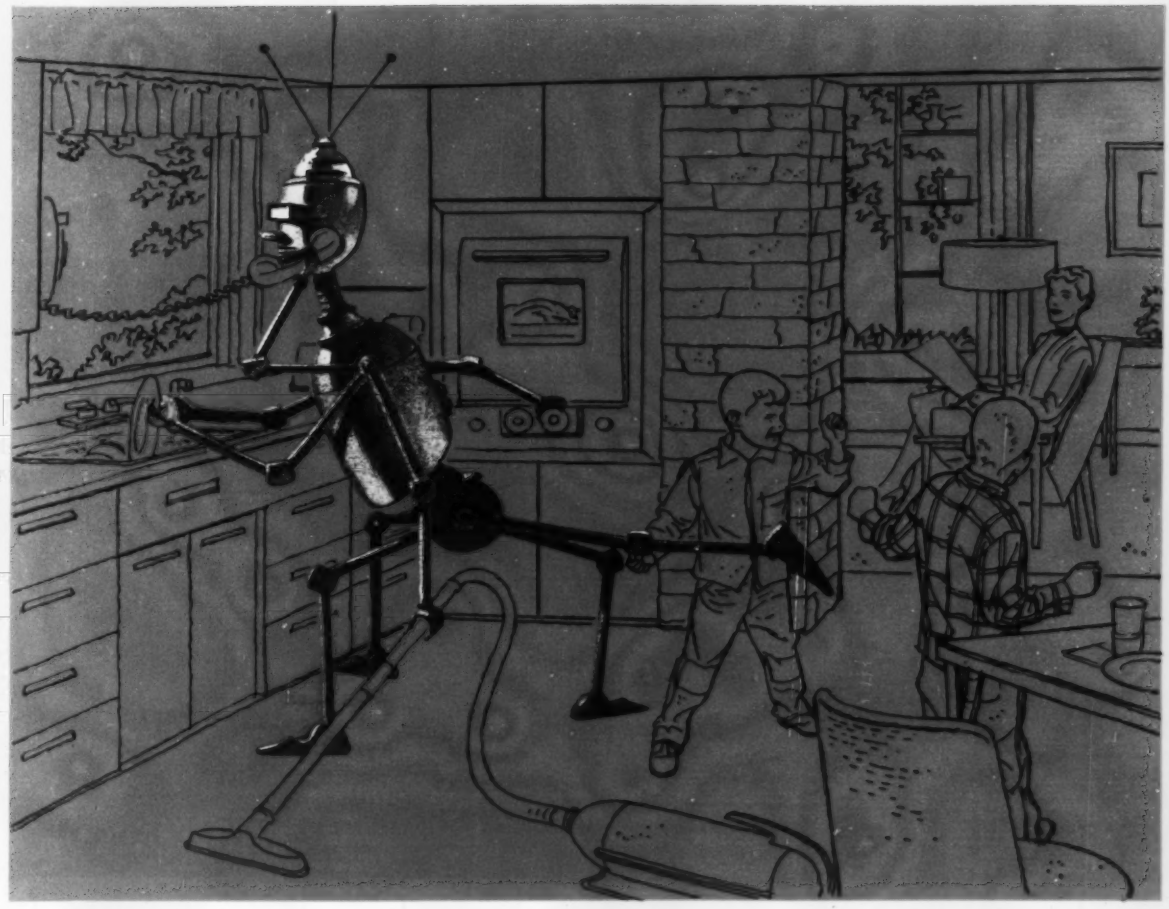
The fact that American Brass has called upon us time and again over a period of 16 years strongly testifies to our ability to provide machinery of the most advanced design and for long, trouble-free service. For further information on how our facilities may best serve your interests, write us at Dept. B-7.

Loewy-Hydropress Division

BALDWIN · LIMA · HAMILTON

111 FIFTH AVENUE, NEW YORK 3, N.Y. Rolling mills • Hydraulic machinery • Industrial engineering

BALDWIN · BLH · LIMA-HAMILTON



No matter what you make from Cold Rolled Steel

An ALAN WOOD Representative can help!

If you produce this gadget . . . housewives will love you. Your market would be endless. But there would be problems about the kind of steel to use. Better call your A.W. Representative. Your A.W. Representative may order a metallurgical study of your problems and bring about savings that build new profits and increased production. He can provide you with the latest information on cold rolled steel and its application, plus experienced advice on the gauge, size and type to order. Call him today. Your A.W. Representative is always available . . . never out of touch with your location.

ALAN WOOD STEEL COMPANY

steelmasters for more than a century and a quarter • CONSHOHOCKEN, PA.

DISTRICT OFFICES AND REPRESENTATIVES: Philadelphia
New York • Los Angeles • Atlanta • Boston • Buffalo • Cincinnati
Cleveland • Detroit • Houston • Pittsburgh • Richmond • St. Paul
San Francisco • Seattle

Montreal and Toronto, Canada—A. C. Leslie & Co., Limited

IRON PRODUCTS
"Swede" pig iron

STEEL PRODUCTS
Plates (sheared)
A.W. Dynalloy (high strength steel)
Hot rolled sheets
Hot rolled strip
Cold rolled sheets
Cold rolled strip

ROLLED STEEL FLOOR PLATE
A.W. Algrip abrasive
A.W. Super-Diamond pattern

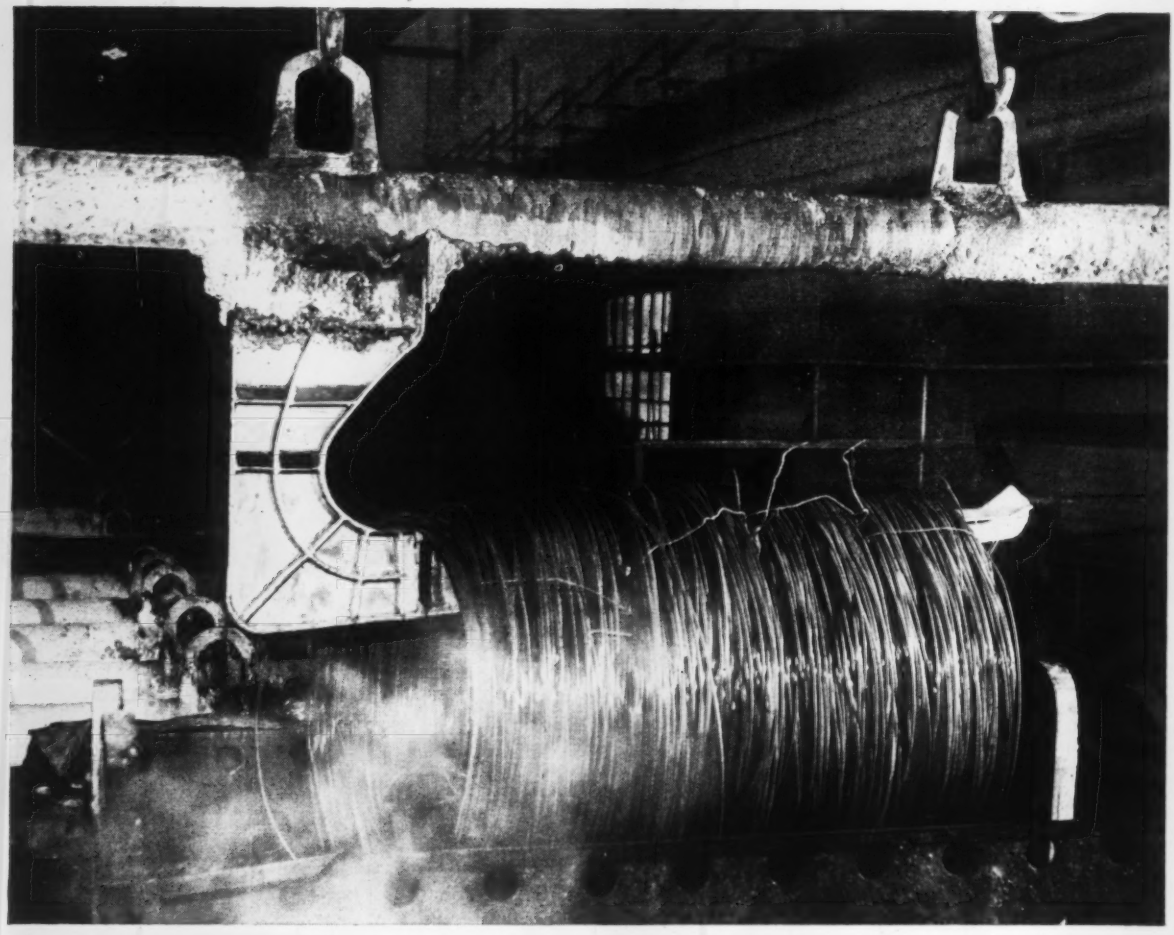
COAL CHEMICALS

A.W. CUT NAILS
Standard & Hardened

MINE PRODUCTS
Iron ore concentrates
Iron powder
Crushed stone
Sand

COKE
Foundry, industrial & metallurgical

PENCO METAL PRODUCTS DIVISION
Steel cabinets, lockers & shelving



Monel Pickling Hooks give improved service life at Colorado Fuel and Iron

Pickling hooks were a major problem for the Colorado Fuel and Iron Corporation. They corroded too fast.

So Colorado decided to try Monel* nickel-copper alloy pickling hooks. The result? The photo above gives you the answer. This hook has been on the pickling line five years, three shifts a day – yet you can see its excellent condition. Today, this Monel hook is expected to outlast predecessors by a wide margin.

Monel hooks last longer because Monel has excellent resistance to corrosion by sulfuric acid pickling solutions. Monel alloy is strong and tough. In fact, it's the strongest nonferrous metal you can use for pickling equipment.

Monel hooks save money other ways, too

This combination of strength and corrosion resistance saves money in several ways. Besides longer life, it permits greater payloads. And because Monel alloy is readily fabricated and welded, a hook can be quickly and economically repaired if it's damaged. Or it can be rebuilt to extend service life even further.

Improves other pickling equipment, too

Not only in hooks, but in *all* pickling equipment – slings, chains, bolts, tie-rods – Monel alloy can save you money . . . cut deadweight, outlast other materials. To get an idea of savings you can expect, write Inco for a copy of a useful 32-page handbook, "Equipping the Pickle House for Greater Production at Lower Cost."

*Registered trademark

The International Nickel Company, Inc.
67 Wall Street New York 5, N. Y.

INCO

INCO NICKEL ALLOYS

STEEL

July 21, 1958

Metalworking Outlook

Defense Spending To Rise

Look for the Mideast crisis to boost defense spending, particularly the metalworking part of it. Since the end of the Korean War, some 13 per cent of metalworking's dollar volume has been going to defense each year. That ratio is likely to rise, even if the presence of U. S. troops keeps the lid on in Lebanon. About 10 per cent of the general economy has been devoted to defense since Korea.

Canadian-U. S. Customs Union?

Don't expect much action soon on a Canadian-U. S. customs union or free-trade area. President Eisenhower's trip to Canada revived talk about the matter, and a recent Rockefeller report advocates such an arrangement. Sentiment for it is stronger south of the border than north. But you can watch for more attention being given to ways to increase north-south trade.

Pressure Builds in Auto Talks

A good bet: By the end of this month, General Motors Corp. will offer the United Auto Workers a contract extension of two years, with additional supplemental unemployment and pension benefits. The offer will differ from the earlier one chiefly in sweeter SUB and pension deals. If the UAW won't buy the proposal, GM will probably get ready to take a strike. The auto negotiations resumed last week, with the union predicting it will have new contracts with the Big Three "before new models roll off the assembly line this fall." GM has signed two-year extensions with eight unions other than the UAW. The typical agreement calls for a wage boost of 6 cents an hour or 2½ per cent (whichever is greater), effective May 29, 1958, and May 29, 1959.

$106 per Man per Month in Fringes

Fringe benefits average $106.07 per month for each hourly employee of Ohio Seamless Tube Div. of Copperweld Steel Co., Shelby, Ohio. Here's the average breakdown: Vacation pay—$22.18, holiday pay—$11.96, lunch period pay—$11.25, pension funding—$25.49, social security—$7.88, group insurance—$10, compensation insurance—$2.22, unemployment insurance—$3.08, supplemental unemployment benefits—$8.09, miscellaneous—$3.92.

Middle Managers Win Pay Boost

The salary of the "average" business executive in middle management rose 4.8 per cent—from $11,240 a year to $11,800—from 1957 to 1958, reports the American Management Association. The increase from 1956 to 1957 was 5.8 per cent. The Canadian (with a 5.2 per cent rise) did somewhat better than his U. S. counterpart, but Canadian middle managers are paid on a

Technical Outlook—Page 111 Market Outlook—Page 145

lower scale. Bonuses were paid to 37 per cent of the executives covered, vs. 45 per cent the year before.

Can the Minerals Bill Make It?

Passage by the Senate of the Seaton plan for domestic minerals stabilization raised hopes that it can get through the House before the go-home fever strikes. In the Senate, only 12 "nays" were recorded, although 14 senators didn't vote. House committee hearings were scheduled on the measure late last week, and chances are good that it will come to the floor without major modifications, but odds for House passage run about 60-40 against it.

Industry To Push Science for Youngsters

As a long range attack on the shortage of electronics and missile engineers (which promises to become rapidly more serious), the Pentagon and the President's Committee on Scientists & Engineers want defense contractors to back local "action" groups for improving science education and encouraging competent youths to enter science and engineering. Interested firms can check with local Defense Department sources for summaries of programs. Local installation commanders are also ready to help youth missile groups along the lines of a program suggested by Kendall Hoyt of the Association of Missile & Rocket Industries. The point of all this activity: Private industry must do everything it can to promote interest so engineers will be in ready supply in the 1960s and 1970s when missiles come of age, says Mr. Hoyt.

The Peaceful Atom

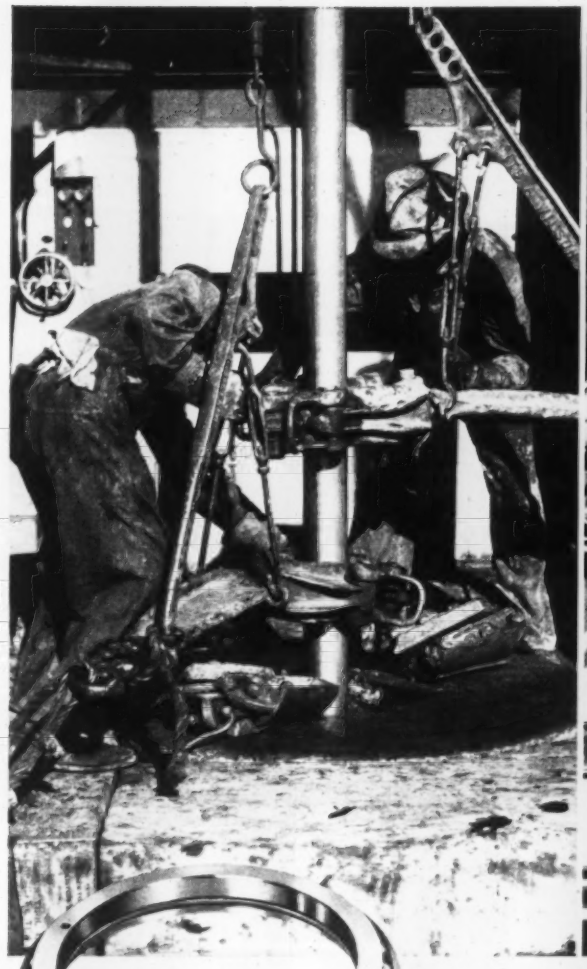
Industry may harness the power of nuclear explosives for peaceful uses by 1960. The Atomic Energy Commission is studying the possibility of using the atom to create harbors, recover oil, and mine. The first project may be the excavation of a harbor on the northwest coast of Alaska.

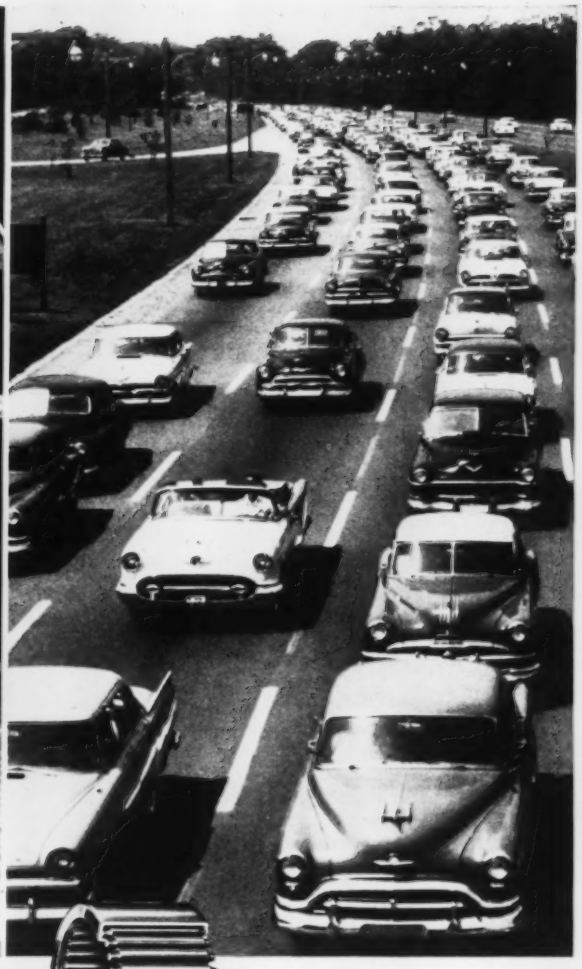
Rail Capital Spending Skids

Railroads estimate they'll spend $706 million on capital additions and improvements in 1958. That's 49 per cent below the 1957 figure when the roads spent $1.4 billion. Even with the government help provided in the Smathers Bill, passed by the Senate and pending before the House, the carriers are not likely to boost spending much this year. The bill provides for $700 million of federally guaranteed bank loans to help the rails finance improvements.

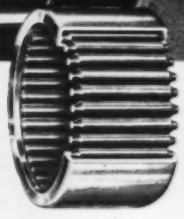
Straws in the Wind

The International Labor Organization has forwarded to its 79 member governments a proposal that pooled orders for standard types of machinery be used as an antidote to the recession . . . Ormet Corp. has brought in the second of five potlines at its $110 million primary aluminum reduction works at Omal, Ohio; by yearend, Ormet expects to have all five lines operating to produce 180,000 tons annually . . . The Army Signal Corps anticipates a fivefold boost in its use of electronic equipment.





from drilling rigs...



to automobiles

Torrington makes the right anti-friction bearing for every basic need!

In the oil fields where your gasoline originates, the need may be for a special Torrington Angular Contact Rotary Table Bearing to support thousands of feet of whirling drill string. In your car, it may be a compact Torrington Needle Bearing to smooth your steering.

Between these two examples lie all kinds of requirements. To meet this broad range of needs, Torrington makes every basic type of anti-friction bearing.

You can be confident that engineering recommendations from Torrington will bring the broadest experience to bear on your specific application requirements. For help in developing the *right* anti-friction application for your product, rely on your Torrington representative. **The Torrington Company, Torrington, Conn. —and South Bend 21, Ind.**

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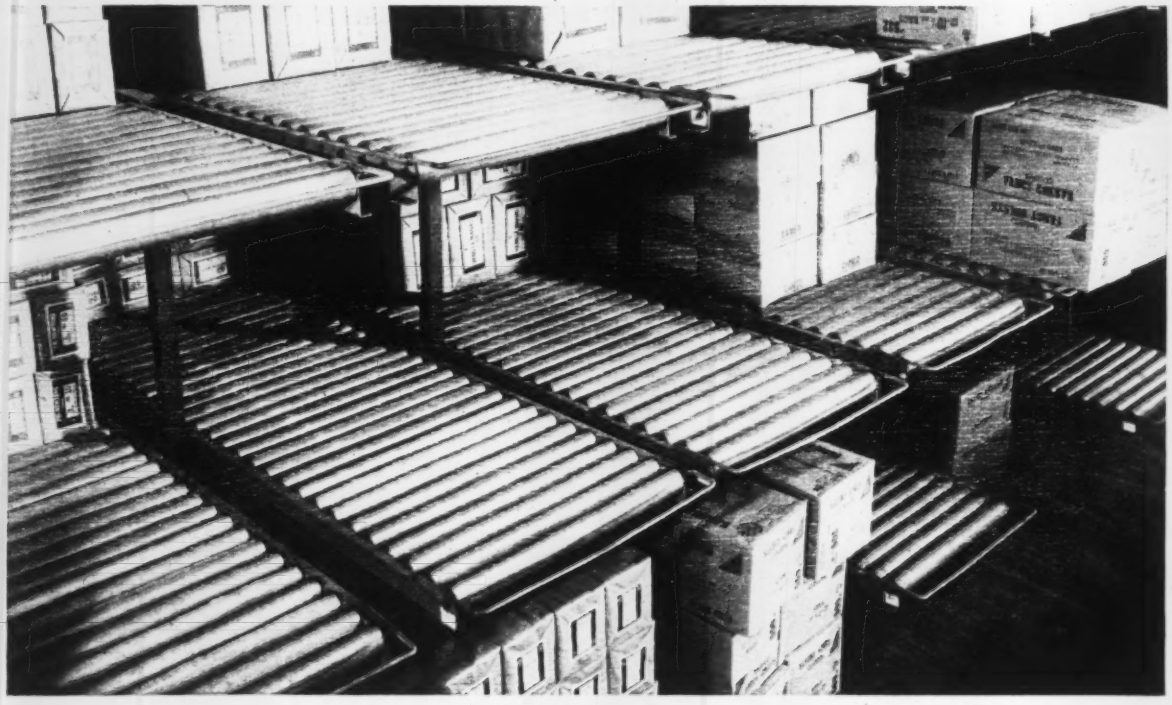
Packages get off rust-free
WITH ARMCO ZINCGRIP TUBING



Rusty conveyor rolls can stain packages. That's why National Biscuit Company engineers specify rollers made of Armco ZINCGRIP® Steel Tubing.

The tight zinc coating on special Armco ZINCGRIP Tubing seals out moisture. Rust doesn't get a foothold. Packages make a clean getaway from warehouse conveyors.

Strength, low cost, and attractive appearance are three more reasons why ZINCGRIP Tubing is specified. Add the fact that it can be easily fabricated without flaking or peeling of the zinc coating and you'll see why it is now used to give a competitive edge to a growing number of products.

If you make or use conveyor rolls, TV masts and antennas, scaffolding, gate posts, or any other tubular products or parts that must fight rust, why not get all the facts about Armco ZINCGRIP Tubing? Fill in the coupon. (If you are looking for tubing with superior resistance to heat and corrosion, ask about Armco ALUMINIZED STEEL Type 1 Tubing.)

New steels are born at Armco

ARMCO STEEL CORPORATION, 2538 Curtis St., Middletown, Ohio

Please send me information on
- ☐ Armco ZINCGRIP Tubing
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Russia's New Hot War

Soviet Russia is camouflaging her real intentions behind a screen of confusion.

Her leaders talk about a high level summit conference to iron out differences between the Soviet bloc and the West. They crack down on Tito's so-called "Revisionism," or defection from Moscow's control. They mark Poland's Gomulka for their next purge.

At the same time, they wage economic war as the easiest approach to accomplishing their political objective of world communism.

Because Russia's industry is state owned, Khrushchev can direct production where he pleases without regard to costs and selling prices. Seventy per cent goes toward building industry at home, expanding industry in other communist countries (especially China), and extending Russia's economic influence in the Western World.

A case in point: Look at how Russia is invading the international aluminum market. Her pig aluminum customers include Belgium, France, Italy, and even the U. S. Part of the aluminum sold to other countries is also coming to the U. S. as fabricated products at prices 15 cents under those of the domestic market. In addition, our import duty on aluminum was cut from 1 1/3 to 1 1/4 cents on July 1.

This is going on at a time when the U. S. aluminum industry is having its troubles. Of 2,062,500 tons of basic capacity, 603,500 tons stand idle. Some 20,000 people are without work. Construction on 511,000 tons of additional capacity is largely held up because demand is lacking.

Much of our expansion in aluminum took place during World War II and the Korean War at an investment of more than $2.5 billion.

In contrast, Russia is building at least three new plants in Siberia while dumping metal that became surplus when her military requirements changed.

Aluminum is only one example. Russia is making metal cutting machine tools at the rate of 133,000 a year—far more than we're producing. The Russian machine tools are finding their way into Western countries in increasing numbers.

So far, Russia's economic competition has been regarded by U. S. government and industry as nothing more than an annoyance. It now has arrived as a hot war far more threatening than the cold war on the political front.

Irwin H. Such

EDITOR-IN-CHIEF

and now it's....

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Yes, *washed washers* are the latest practical innovation introduced by Wrought Washer Mfg. Company, applying to all popular sizes of U. S. Standard and SAE Washers, including also Rivet Burrs and Machinery Bushings. All grease, graphite, oil and other foreign matter is removed by our special washing process. This is a new *plus value* over and above the consistent high quality which is an inherent part of all Milwaukee Wrot Washers . . . *at no increase in price!*

No matter what your washer requirements may be . . . every type, size, material and finish . . . look to Wrot Washer as your No. 1 source. Write for Catalog No. 40.

DEALERS: Order from your regular jobber . . . 1-lb. and 5-lb. packages, put up in 200 lb. shipping cartons.

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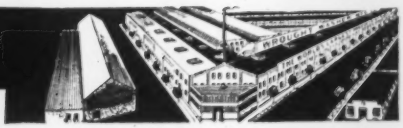
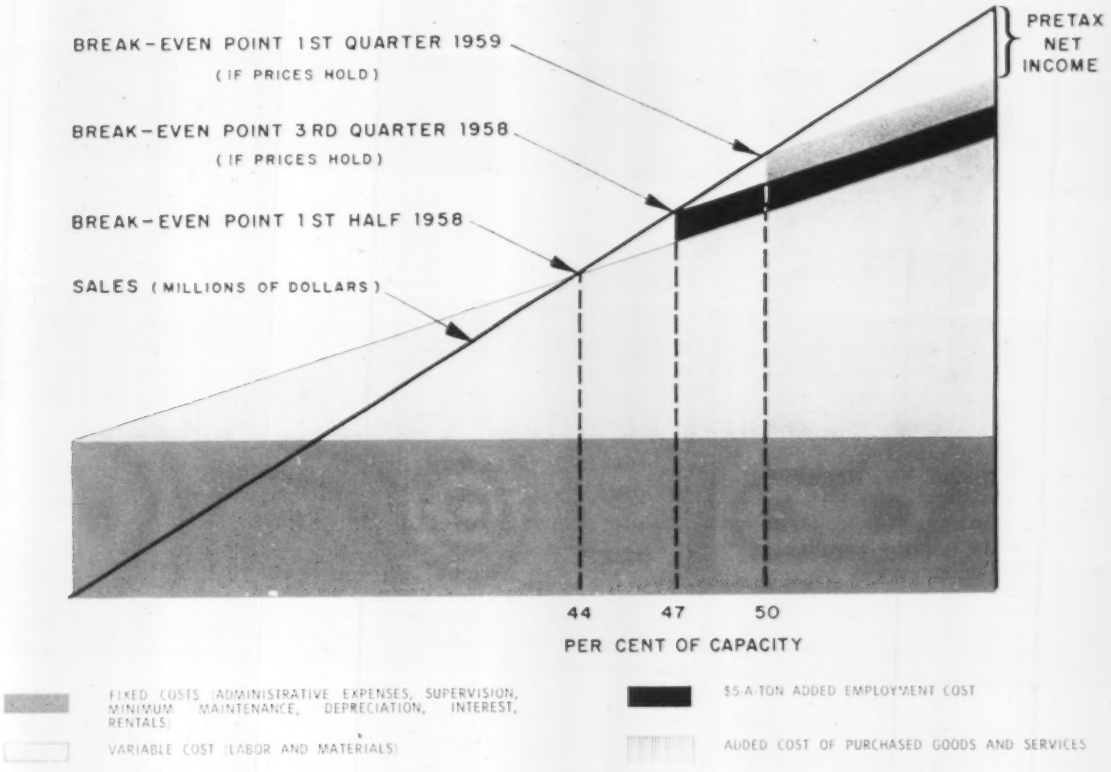


How Higher Costs Will Affect J&L's Operations


BREAK-EVEN POINT 1ST QUARTER 1959
(IF PRICES HOLD)
BREAK-EVEN POINT 3RD QUARTER 1958
(IF PRICES HOLD)
BREAK-EVEN POINT 1ST HALF 1958
SALES (MILLIONS OF DOLLARS)
PRETAX NET INCOME
44
47
50
PER CENT OF CAPACITY
FIXED COSTS (ADMINISTRATIVE EXPENSES, SUPERVISION, MINIMUM MAINTENANCE, DEPRECIATION, INTEREST, RENTALS)
VARIABLE COST (LABOR AND MATERIALS)
$5-A-TON ADDED EMPLOYMENT COST
ADDED COST OF PURCHASED GOODS AND SERVICES

Rising: Prices or Break-Even Points?

THE steel industry's break-even point, ordinarily of interest only to specialists, is a matter of widespread concern this year.

Example: Added employment costs incurred July 1 (about $5 a ton) will boost Jones & Laughlin Steel Corp.'s break-even point from 44 per cent in the first half to 47 per cent in the third quarter. If prices hold, pass-along costs will push it to 50 per cent by the first quarter of 1959.

For the first time in years, steelmakers are operating at a marginal level, worrying more about making a profit than the size of it. During the first three months, they earned $135 million on sales of $2.7 billion. Average earnings were 5 cents on the sales dollar, but results varied from plus 7.8 cents to minus 3.

Small Margins—Avery C. Adams, president of J&L, brought the issue into sharp focus when he announced that his company made a small first quarter profit (1.1 per cent of sales) while operating at 57 per cent of capacity and shipping at 52 per cent. J&L made 2.6 per cent on sales in the second quarter while producing at 55 per cent and shipping at 55.5 per cent.

J&L would break even at 44 per cent, he added, "after completion of our current construction program and after the new units are broken in." He assumed, of course, that there would be no changes in the employment cost-selling price relationship, product mix, or "other material factors."

"The relationship of employment costs to selling prices underpins the whole thing," says one steel executive. "If your labor bill goes up without a corresponding increase in prices, your break-even point moves up too."

If J&L operates at 65 per cent during the third quarter (Mr. Adams' projection for the industry) and sells at current prices, it will net about $8.25 million instead of $10.5 million, the amount forecast when it was assumed that the employment cost-selling price relationship would not be altered.

Needed: Higher Prices—If J&L

and other steelmakers get a satisfactory price adjustment ($5 or $6 a ton), their break-even points won't be impaired during the second half. They'll pay more for purchased goods and services, but not before next year's first quarter. By that time, it will cost them $10 more to produce a ton of steel than it did in June.

Product Mix Important—It's well to remember that product mix is often a better index to profitability than the production rate. This is especially true for smaller companies. A specialty producer might make a profit at 35 per cent of capacity by concentrating on its most lucrative items but bankrupt itself at 65 per cent by making too many tons of low-profit steel.

Larger companies tend to have lower break-even points than smaller ones because they're more highly integrated.

Steelmakers say the break-even point changes from week to week within a company and from day to day within the industry even when there are no dramatic cost changes, such as wage or price increases. Reason: There's a wide range of efficiency in the industry's equipment.

J&L's Method—Undismayed by problems involved, Jones & Laughlin uses this method to chart its earnings: Starting with its salesmen, it asks them—on a product - by - product basis — what they would expect to sell if conditions were "normal." Then it asks what they would sell at various operating levels between 40 and 100 per cent. Using expense budgets, the company "manufactures" the products on paper. It tries to establish a budget that's flexible enough to serve at several levels.

Armed with the salesmen's estimates, J&L asks its operating people what machines they would use, how they'd crew them, and how many turns they'd operate if they could produce just so many tons a month. Then maintenance men are asked how much maintenance they would do. Finally, it asks top management whether the performance standards decided upon would be satisfactory under given conditions. If management says yes, J&L has a master plan. Every department knows its job at each operating level.

SKF Industries Inc.

Sales

Second half	
1958	$304,167
First half	
1958	267,539
Full Year	
1957	666,700
1956	730,000
1955	673,933
1954	533,796

Estimated by STEEL.

Bearings Recover Slightly

Industry spokesmen expect 1958 sales to be under last year's levels. But they point to signs of an upturn in the second half. Export market is also slow

SALES of antifriction bearings are on the upturn, but most industry estimates indicate the year as a whole will be down.

One manufacturer estimates that second half business will be about 5 per cent better than it was in the first. Another believes the last half will show "definite improvement." He points to strong indications "that inventory backlogs are being worked down to where it is reasonable to expect an upturn in purchases."

Estimates Vary—But E. R. Broden, president and chairman, SKF Industries Inc., Philadelphia, believes business will be about 15 to 20 per cent under what it was in 1956 and 1957. Another manufacturer expects industry sales this year to hit $571.7 million, vs. $666.7 million in 1957. McGill Mfg. Co. Inc., Valparaiso, Ind., doesn't expect much change in its sales, "although shipments may be off 10 per cent."

Buying by major consumers (automotive, machinery, replacement, and military) has been generally slow, especially heavy machinery.

J. F. Oehlhoffen, vice president, Kaydon Engineering Corp., Muskegon, Mich., expects his firm's business in the second half to be about 30 per cent better than the first half's and the year as a whole to compare "favorably with 1957 . . . probably be a little better."

Bright Spots—Holding up best are

industries doing business with the government (aircraft, missiles, and related industries) and the mining, crushing, and road machinery fields. One of the hardest hit, the automotive industry, should bounce back with new models this fall, believes Mr. Oehlhoffen.

Kaydon is now building bearings 165 in. in diameter for radar equipment.

Farm Buying—Dodge Mfg. Corp., Mishawaka, Ind., manufacturer of mounted antifriction bearings, reports that agricultural equipment needs are holding up well and that sales to the steel industry have improved, "probably due to the policy of expanding during periods of low production." But over-all sales are off, chiefly because of the decline in automotive activity.

One manufacturer of cylinder roller bearings declares that bright spots this year have been in aircraft and agricultural equipment requirements. He estimates that shipments in general will be about 30 per cent below last year's with no appreciable pickup likely in heavy industrial needs before the fourth quarter.

A manufacturer of ball bearings expects a general decline in business this year, with the second half about 15 per cent off the first half pace. Automotive and machine tool requirements are down the most, the company declares; specifications from manufacturers of household durables, such as laundry equipment and vacuum cleaners, are holding up best.

Export-Market Slow — Imports present some problems: Foreign manufacturers can take care of their local requirements and are turning to the world market for additional business. Mr. Broden thinks they are more active in other areas than they are in the U. S. He says: "However, we can expect increased pressure due to the world economic situation. Foreign countries need U. S. dollars to support their imports from the U. S. It is vitally necessary for them to export some products to the U. S."

Export business was off in 1957, due mainly to the increased availability of foreign bearings and a lack of money. But trading is still fairly good.

"We cannot compete pricewise with European or Japanese manufacturers," Mr. Broden says. "But there are many bearing sizes made in this country which are not manufactured overseas, and demand for them will increase as the export of American machinery increases. Also, we often offer quicker delivery to our overseas customers than they can obtain from foreign competition."

Trend to Automation — Among about 70 U. S. antifriction bearing makers (25 to 30 make only ball bearings), there is a move to greater mechanization and automation. Timken Roller Bearing Co., Canton, Ohio, has finished a $7-million railroad bearing production line at its Columbus, Ohio, plant. It incorporates many automatic features and is capable of producing 20,000 car sets yearly. Company officials say increased efficiency in production has reduced the price per set by more than 50 per cent in the last decade.

Trend in Materials—More use is being made of vacuum melted steels and other alloys in bearings for aircraft, missiles, and atomic energy requirements. Bearing manufacturers and steel producers are doing research on high temperature applications. Increased operating temperatures of aircraft powerplants have necessitated the development of steels which retain their hardness better than the more commonly used bearing alloys under such conditions.

A SPECIAL FUEL CELL will be seen by World's Fair crowds at Brussels, Belgium, combining gases to produce electricity. Exhibited by National Carbon Co., a division of Union Carbide Corp., it uses chemical energy of hydrogen and oxygen. Dr. Clarence E. Larson, research vice president, examines unit

Growth in Mexico

Engineer predicts that steel production will nearly double by 1961. Consumption to soar

MEXICAN steel production hit 700,000 tons in 1957 and will climb to 1,510,000 tons by 1961, predicts Fernando Gonzalez, a metallurgical engineer.

In a report prepared for the Mexican National Chamber of Iron & Steel Industries, Mr. Gonzalez estimated that internal consumption of steel will soar to 1.8 million tons by 1961. Some 290,000 tons will be imported.

Steelmaking Facilities — Apart from Hojalata y Lamina S. A., which operates five electric furnaces, Mexico has 18 other plants which operate 30 electric furnaces with a total capacity of 400,000 tons of liquid steel.

Many of the ovens are used primarily for casting small molded pieces. With small capacity furnaces and high power costs, production costs are topheavy, compared with those of integrated plants. Mexican plants turn out steel ingots for about 700 to 750 pesos ($56 to $60) per ton when operating Seimens-Martin high-capacity ovens.

Small furnaces (5 to 10 tons of capacity, using scrap bought at 650 pesos, or $52 a ton), produce small steel ingots at a cost of 1100 to 1200 pesos ($88 to $96) per ton.

Mexico has only five furnaces with normal capacity greater than 10 tons (including the three major ones at Hojalata and Lamina). Twenty have capacities of 2 to 9 tons. The remainder have capacities of 1 ton or less.

Long Range View—Mexican steel executives feel that the future for smaller steel operations lies toward decentralization and the establishment of new high capacity plants. Needing heavy financing, the steelmakers are planning a "program for tomorrow" to present to President-elect Adolfo Lopes Mateos who takes office in December.

18 Often Ignored Ways

YOUR company loses money every time a drop of water escapes from a leaky valve, an unnecessary telegram is sent, or a key man quits his job.

Such items represent a big reservoir of potential savings that can be tapped by many metalworking plants: Fringe areas range from reducing the number of men who attend conventions to trimming inventories of parts. In fact, it's a safe bet there's no area in your operation where money can't be saved.

Of course, the most dramatic savings are obtained by installing new or modified equipment to lower unit production costs (as pointed up by STEEL in its Cost Crisis series). That and the more economical purchase (and use) of materials have received microscopic examination by metalworking management. Fringe areas remain the stepchild of many cost reduction programs.

Where To Begin—W. T. Pinney, vice president, Profit Counselers Inc., New York, suggests the best programs start with each department head making a thorough study of his operation. He should ask himself: What needs to be done? What are we doing? What can we eliminate or improve?

The next step is to set down a list of your objectives. Then fix and assign areas of responsibility, set up machinery for co-ordinating the program, and explain to workers what you are trying to do.

Mr. Pinney cites this case: A midwest maker of components with a yearly sales volume of $3 million was concerned about the cost-price squeeze. Profit Counselers found the company could trim expenses by: Better purchasing, lower shop costs, reduction of shipping costs, elimination of overtime, and product redesign. Result: Savings of $120,000 yearly.

What Not To Do—Don't confuse cost reduction with cost deferrals. Example: Some firms have agreed to fund pension plans over ten years. But there is often no specific yearly amount that has to be set aside. It's reported some are holding off on this year's payment as a means of cutting costs. That's just postponing the inevitable since the amount will have to be made up later.

Four Don'ts—Cost consultants generally make these recommendations to clients: 1. Don't cut haphazardly. 2. Don't be afraid to spend money to save. 3. Don't be ashamed to push "nickel and dime" savings—it's estimated a 1 per cent cut in over-all costs can add as much as 10 per cent to net profits. 4. Don't operate your program as a hit-and-run proposition. Cost reduction has to be constant to be successful.

Here are 18 of the many fringe areas in which metalworking companies are pruning costs:

PERSONNEL: Are you topheavy with unproductive employees? A quick check might show you where duties can be doubled up, functions eliminated.

Charles Hawkins, vice president, Trundle Consultants Inc., Cleveland, offers this advice: "Figure out how many and what kind of men you need. Ask yourself: Have you picked up men you don't need? What functions can be combined? Send your cost reduction group into every area where there is even one man working and look him over. Remember, when you eliminate a man, you save on more than salary. You also save on items like fringe benefits, office space, furniture, travel, postage, and stationery."

JOB TURNOVER: Loss of a productive employee can be costly. Douglas Gould, a Trundle vice president, gives this example: An electrical apparatus firm had a 30 per cent turnover in sales personnel, vs. an industry average of 7 to 8 per cent. A study showed the company was losing around $5000 every time a salesman quit. In a single year, it cost the company over $400,000.

To Cut Costs

Turnover is now down to the industry average and is expected to fall lower. How it was done: 1. Compensation plans of salesmen were revamped. 2. Regional managers are giving salesmen closer supervision. 3. Territories are better balanced to provide more potential. 4. Salesmen have been encouraged to push high profit items.

TRAFFIC: Ask yourself these questions: Is your product properly classified so that it falls into the most economical freight rate category? (This is the most important cost saving area in traffic, says Carl Colzani, traffic manager for Federal Pacific Electric Co., Newark, N. J. His firm has run annual shipping savings to $150,000 over a three-year period.)

Is it necessary to crate your products? Did you know that on shipments West you can use three refrigerator cars for the price of one boxcar? Are you scheduling incoming shipments to hold down demurrage charges? Do you route shipments for greatest economy? (This may mean shipping goods to Los Angeles that are ultimately destined for San Francisco.)

Investigate water transportation, both inland and ocean. You can save from $1.84 to $3.94 a hundredweight by shipping via water from the East to the West Coast, says Mr. Colzani. If prompt delivery is not a factor (it takes four to six weeks), that may be your answer.

Rockwell Mfg. Co., Pittsburgh, feels traffic is so important it issues a bimonthly newsletter to keep personnel informed on latest developments. It contains such information as: 1. Shipments to municipalities are exempt from the transportation tax. 2. Export packing done at the pier rather than the plant will save inland transportation fees on the weight of the crating.

UTILITIES: John D. Staley, personnel division manager, American Management Association, New York, says water, electricity, and steam costs can be cut 25 per cent by eliminating waste. One way: "You might try billing utilities to each department and make them responsible for excessive charges."

Another tip from Mr. Staley: "In many instances, the daily electricity charge is based on peak demand. You might stagger the morning startup of equipment to pull down the power demand curve. An alternate solution might be to check with your engineering department about putting in capacitors."

INSURANCE: Rockwell Mfg. Co. took a look at this item and decided to combine all functions which were formerly handled at the plant level into a central office. Some results: 1. It reduced the number of policies under the heading "fire and extended coverage" from over 400 to two, with an annual saving of thousands of dollars. 2. By combining all auto insurance on company owned vehicles in a fleet policy, the company is saving $6000 a year. 3. Rockwell found that because of its low auto accident rate it was cheaper to drop collision insurance.

MAINTENANCE: "Important as repair and maintenance costs are today, they will increase as automation takes over jobs now performed by labor," says Thomas Cahill, McKinsey & Co., New York. "But maintenance is only 30 to 50 per cent effective in most plants," adds Mr. Staley.

Says Mr. Cahill: "The two factors that determine maintenance costs are the amount of maintenance and the efficiency with which it is performed. Because the two factors are usually the responsibility of different persons or groups, they must be measured and controlled independently. Such an approach can be effective if: 1. The organization plan is established so that accountability for the amount and efficiency of maintenance can be pinpointed. 2. The amount is controlled by comparing the standard or estimated cost of work performed against the budget. Efficiency is controlled by comparing the standard or estimated cost of work performed against the actual cost of work performed."

COMMUNICATIONS: Do you encourage your people to wire instead of phone? Write instead of wire? Can some of your mail be sent other than first class?

An eastern company saved $100,000 in long distance telephone calls over the past year. Its method: Everyone who talks long distance for more than 3 minutes has to submit a written report to the controller, telling who they talked to, why the call was necessary, and why it took so long.

DISTRIBUTION: Are your warehouse locations based on 1940 thinking? Perhaps you should relocate some, combine others, drop a few. Is your product going from factory to consumer in the most economical way?

MARKETS: Have you analyzed your markets lately? Some firms have found they're trying to sell to the wrong people. Are you going far afield for business when prospects closer to home are neglected?

SALES: Do you have too many salesmen in some areas, not enough in others? Are you making unprofitable sales (better check, many firms have found they are)? Is salemen's compensation out of line with the profitability of the product? Are salesmen operating at peak efficiency? (Experts say your sales force can probably bring in 10 to 15 per cent more business.)

ADVERTISING: Are you promoting products that are high in volume but low in profit? Perhaps you should switch your emphasis to higher profit lines.

TRAINING PROGRAMS: Are they really doing what they were set up to do? It might be better to take the man out of the program and put him to work earning money for you.

RESEARCH: Ask yourself: Is there a market for the product under study? Is it practical? Shake out wrinkles in lines of communication covering engineering, production, and research.

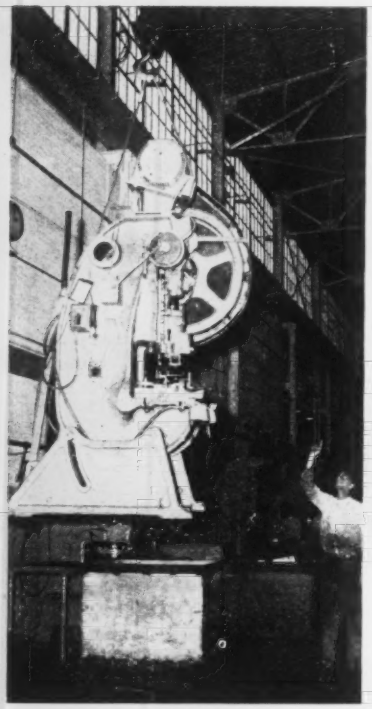
TAXES: Are you paying more than you should? Have you removed the cause of possible penalties?

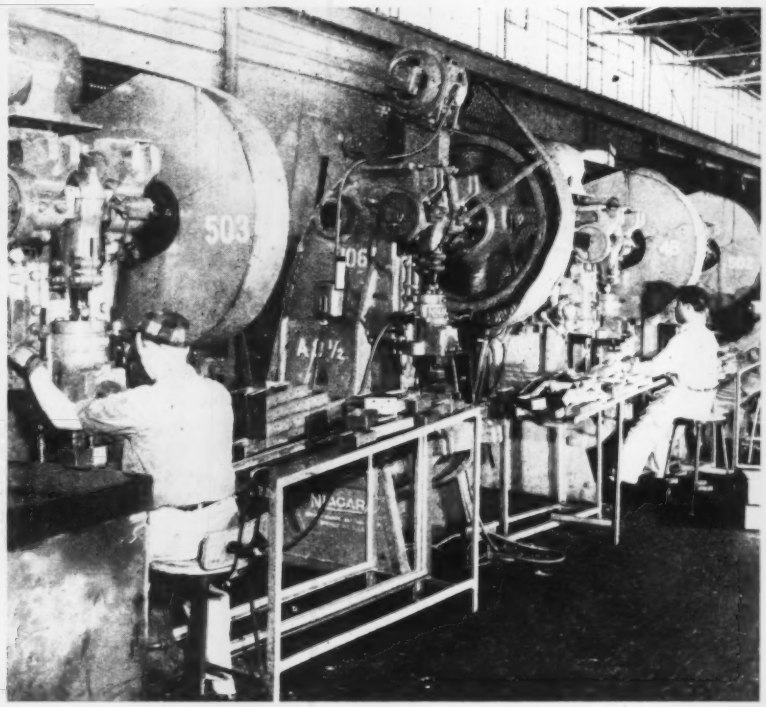
STANDARDIZATION: Investigate using only one make of machine in production lines. Possible savings: Greatly reduced inventories of parts, and mechanics become more adept at repairs.

STORAGE: Are you having problems of inaccessibility, spoilage by damage, pilferage, dust, and dirt? You might want to investigate modern storage units or air filtration.

LABOR: Are you giving in too easily to worker demands that production rates be lowered? That can become expensive, especially if you pay bonuses over a certain quota.

CREDIT: Are you letting collections ride? A little tightening of the credit reins may result in substantial savings. If you have to borrow, check to see if interest rates on short and long term loans have changed enough to call for a revision in your banking practices.





Cranes move presses into position at Federal Pacific where . . .

Machines Are Taken to the Work

JOB SHOP production runs in the pressroom at Federal Pacific Electric Co.'s Newark, N. J., plant are being handled quicker and more economically by taking the machinery to the work.

Layout—The pressroom stamps out enclosures for circuit breakers and switches. There's no problem on long runs: Coil steel is sent through a series of four Verson presses (ranging in capacities from 200 to 400 tons) which shear, punch, flatten, castellate, emboss, and bend it to the proper shape by using six-stage progressive dies.

The dies are expensive and setup is long and complex. "For these machines to reach the economic break-even point, continuous production for at least 20 hours (25,000 enclosures) is usually needed," says Bert W. Herzog, assistant plant manager.

Problem No. 1—Customers often place orders for special runs of a few hundred to a few thousand units. It's too expensive to fabricate the small lots on the Versons. The answer, says Federal, is a series of small presses.

Problem No. 2 — Four small presses usually are needed for the small runs. Because some pieces require but six blows, others as many as 60, it's impossible to set up batteries of anchored presses capable of handling all jobs. Orders had to be broken up and the pieces moved to machines in different parts of the plant. Result: Sharply lowered productivity.

Federal's Solution—A mobile operation was devised for such orders whereby required presses can be quickly transported into any area of the pressroom and positioned into a temporary production line that parallels the mass-production line.

How It's Done—Machines remain permanently unbolted (the pressroom floor is made of wood blocks coated with creosote and imbedded in sand to minimize creepage). Presses are placed by overhead crane or fork truck. Setups are made (sometimes before the machine is moved), the units plugged in, and operation gets underway.

Federal's mobile system is simplified by the fact that the pressroom formerly housed a gray iron foundry. Overhead crane facilities were already in place when the company took over. So were floor channels that hold air, water, and electric lines (simplifying positioning of machines).

Fast Action—Everything is designed for speed. Eyebolts are affixed to presses at balance points so machines can be readily transported without tilting. Colored markings on each press show the lift truck operator where to position the forks.

When an order comes in, the foreman pulls from the files a

master plan for the part which tells him: How many blows will be required, how many dies, and how many (and which) machines, how much sheet steel is required, and production rates.

Press operators work in teams. They have reason to work quickly because they're paid group bonuses over certain production quotas. Generally three men operate four machines.

Advantages—The company cites these from its mechanized pressroom:

- Extreme flexibility is achieved. A complete production line capable of turning out any item can be set up in less than an hour.
- Large runs don't have to be halted to put through small "rush" orders.
- More usable space is available. Idle machines can be stored outside the pressroom.
- Flow time is reduced and stock kept moving. Says Mr. Herzog: "Company time studies have shown work that would have taken as much as a week to move through a normal job shop operation has passed through the new system in as little as 5 hours."
- Total production is increased by reducing time spent per order.
- Material handling is simplified.
- The incentive system increases per unit productivity.
- There are fewer rejects because operators are held individually responsible for quality.

Results—One example of the system's success: A customer recently sent in an order for "immediate delivery" of 1800 special-type fuse panel enclosures. This order could not be filled from stock since Federal normally sells only about 200 per month. By utilizing the mobile setup, the job was done in three days. "Under the old system, pressroom time alone would have been at least three weeks," says Stanley Bogdanski, production control superintendent. He adds: "Time required to process an item from raw steel to finished part can now be measured in hours instead of weeks."

Cost savings have been made all along the line, from increased labor productivity to raising machine output. Two specifics: 1. Material handling costs are down 20 to 25 per cent. 2. Inventory in process has been cut in half.

Reds Make Aluminum War

American producers call for aggressive action as Russian metal upsets world markets. They say the Soviet is boosting exports as an economic tactic aimed at the U. S.

RUSSIAN ALUMINUM in the photograph below looks harmless, but to American producers, it's a weapon aimed directly at this country. They say Soviet production, sold in Europe at "unrealistic" prices, depresses the world market. So does the reaction of European producers to offerings at cut-rate prices. American manufacturers say they mean to do something about it.

About 30 per cent of our capacity is idle, domestic makers report. (See Page 170 for more information on U. S. aluminum production.) Six suppliers told the State Department last week: "We should not have to contend with the exploitation of a temporarily unbalanced domestic market by foreign suppliers. They are channeling their surplus products into it, often at subsidized prices." They called for "bold planning and action."

Aluminum production in the remainder of the Free World averages 90 per cent of capacity, pointed out representatives of Aluminum Co. of America, Anaconda Aluminum Co., Kaiser Aluminum & Chemical Corp., Olin Mathieson Chemical Corp., Revere Copper & Brass Inc., and Reynolds Metals Co. To meet the Russian threat, they urged changes in distribution.

They suggested: Channeling surpluses to underdeveloped nations, establishing an international agency for distribution, and antidumping laws. They discussed limiting imports when this country has surplus metal. They favor negotiation with foreign countries to Congressional action.

Russia's Civilian Weapon — The decreasing importance of aluminum as a Soviet military metal makes it more dangerous economically. Russia built up its light metal industry for its bomber program. Now the emphasis is on missiles.

Irving Lipkowitz, director of economic research at Reynolds, provides this estimate of Russian output:

1939	55,000 tons
1946	104,000 tons
1957	710,000 tons
1961	1,200,000 tons

In contrast, American capacity is now slightly over 2 million tons.

Russian Exports Rise—It's significant, Mr. Lipkowitz points out, that Russia has upset the world market with relatively little export tonnage. Here's a rundown on Russian exports:

1955	13,200 tons
1956	30,600 tons
1957	37,000 tons

"Russian aluminum entered Great Britain at the rate of 2000 tons a month early this year," Mr. Lipkowitz adds. "In a recession, any offer of aluminum below the domestic price exerts pressure. Customers force other producers to meet the lower rates. Russia repeatedly undersells all competition. This is economic warfare, and we can look for it to continue."

This storage yard at a Russian plant holds aluminum pigs. They're a new weapon in USSR's economic arsenal

Alaskan Economic Survey Coming

RAPID DEVELOPMENT of our 49th state is assured if federal and local government agencies push for quick action. The Alaska International Rail & Highway Commission, Washington, is asking Congress for about $300,000 to study need for improved transportation facilities in eastern Alaska and western Canada. The commission is also asking for an extension of its life beyond August.

As its name implies, the commission is primarily concerned with feasible rail and highway facilities, but it is also interested in water transportation. Its survey report will cover present facilities, including the Alaskan highway, which is still just a gravel road over most of its Canadian mileage. Excluding feeder routes from port cities, a railroad or rail-highway system from the U. S. to central Alaska could cost about $500 million. If the commission gets its money from Congress, the report will be in by March, 1960.

A railroad has been talked about for over a century. The latest proposal is from British Columbia: A 750-mile stretch at a cost of $225 million (in 1955 dollars). Problem: The mineral resources of Alaska will have to be proved sufficient to pay for the project. If so, guesses this source, Alaskan development will come even faster than many optimists hope.

Six Censuses from Bureau in '59-'60

Starting in January, the Census Bureau will provide new statistics on population, housing, farming, factories, mines, trade, and services (STEEL, June 16, p. 58). Besides being new marketing data for business researchers, this work will be the basis for the reapportionment of membership in the House for the Congress to be elected in 1962.

These states probably will gain: Arizona—1; California—7; Florida—3; Indiana—1; Maryland—1; Michigan—2; Ohio—2; Oregon—1.

Arkansas, Massachusetts, and Pennsylvania will lose two seats each; Alabama, Georgia, Illinois, Iowa, Kansas, Maine, Minnesota, Mississippi, North Carolina, Oklahoma, Virginia, and West Virginia will lose one seat each.

Space Vehicles Powered by the Sun?

The Air Research & Development Command reports "significant progress" in developing sun-powered generators for the operation of space vehicles. ARDC has two generator cells capable of producing 8 volts of current each; research is being done by Harshaw Chemical Co., Cleveland, and Eagle-Picher Co., Miami, Okla.

Though we are far from eliminating the need for carrying fuel aboard space vehicles, ARDC expects the next step to give us enough solar energy to power the electronic equipment of a space ship. More efficient generators will be developed soon by combining zinc sulfide with cadmium sulfide crystals.

Minuteman Contract Will Be Let Soon

Behind the scenes in Washington, Detroit, and several of the country's aircraft centers, the biggest missile deal to date is taking shape. General Motors Corp. wants the complete contract for the Minuteman (solid-fueled ICBM). Many aircraft and electronic firms are bidding against GM for particular parts of the program. (Eventually, it will involve billions of dollars.)

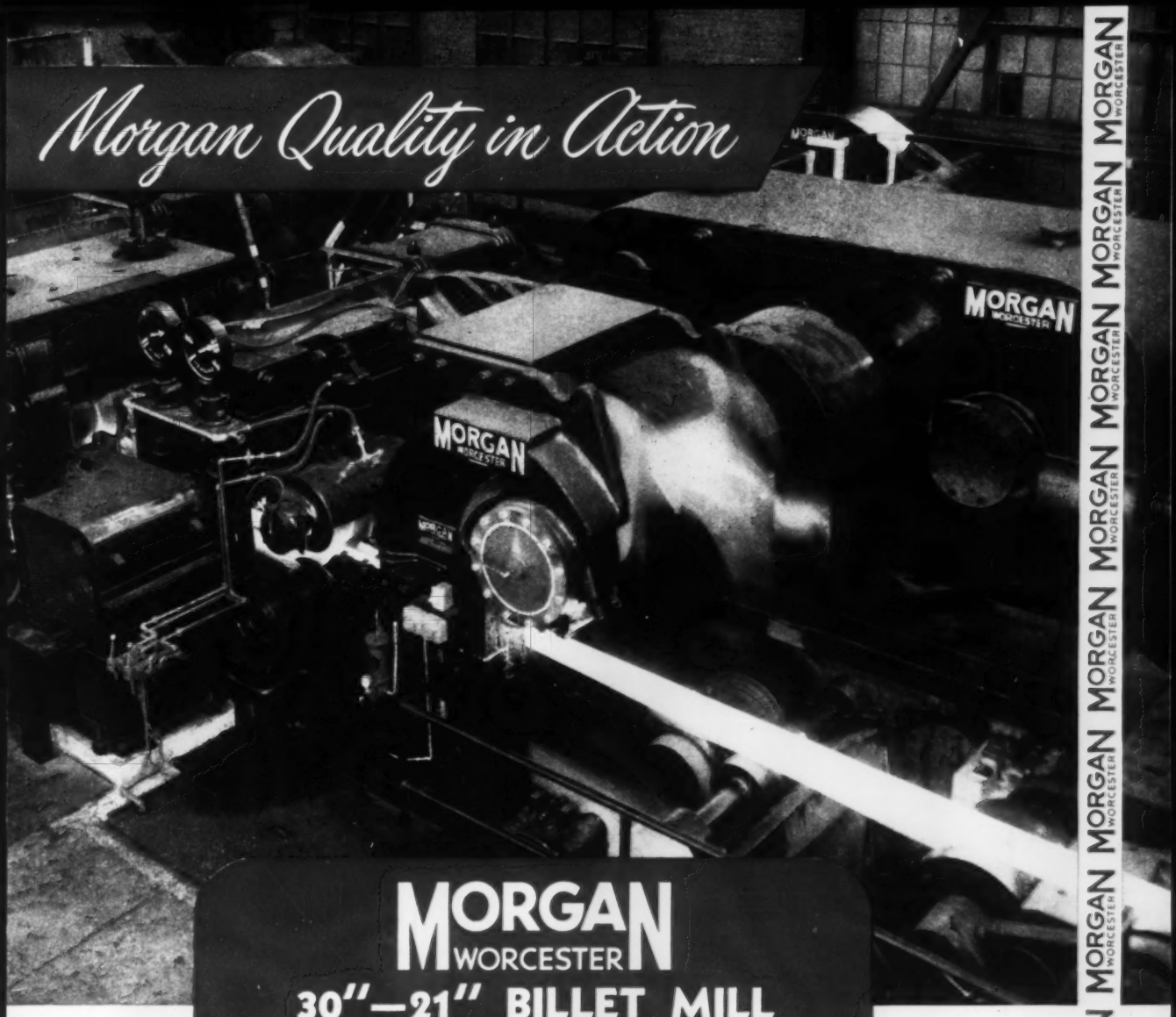
The decision on who will get the contract is rough for the Pentagon because airframe firms are worried about letting such a tremendous order get away. The word in Washington is that the automotive companies have been bidding on big missile projects for the last three years, although Chrysler Corp.'s Redstone-Jupiter project and GM's guidance work are the only big plums to fall in Detroit. The Air Force philosophy of maintaining a healthy airframe industry has worked against autodom several times.

Now, with most of the airframe makers in fairly good shape, it is logical, some say, to let GM tackle the big one. Enough subcontracting would go from GM to airframe firms to keep them happy, yet no single airframe company would get this program to the detriment of the others. A side issue: If GM gets the Minuteman, it would be easier to explain to Michigan congressmen why the Jupiter program may be canceled in favor of the Thor.

Ways & Means O.K.'s Small Business Aid

Small firms will get $250 million worth of tax relief annually if a House Ways & Means Committee bill gets through Congress. Depreciation allowances make up $175 million of the program: In one year, small companies could deduct 20 per cent of the cost of machinery up to $10,000 from their tax bills. Normal depreciation methods will be allowed for the other 80 per cent of their annual investments in new equipment. Applicable to new or used equipment with a useful life of six years or more (Bulletin F), it does not apply to buildings but is retroactive to purchases of equipment made since Dec. 31, 1957.

Other provisions of the bill: 1. Net operating losses can be carried back into three preceding tax years to gain tax refunds. 2. Stock losses (up to $25,000 a year) may be treated as ordinary rather than capital losses. 3. Estate taxes can be spread over ten years. Outlook for passage: Almost a sure thing.



MORGAN WORCESTER

30"—21" BILLET MILL

with No. 5 Electric Flying Shear in Action

Every Morgan Mill is developed by highly skilled technical engineers to answer the exacting demands of mass production. Morgan introduced the first successful continuous rolling mill in this country—and has consistently maintained leadership in producing quality, high production mills in this country and abroad.

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Star studded with economy features
Cutler-Hammer Three-Star Unitrol

Standardized Modular Construction

All control units are 20" wide and in multiples of 14" in height. This permits easy interchange of various sizes and types of control units without rearrangement of the entire control assembly and avoids wasting space with dead panels to adapt non-uniform control units. This standardized modular construction also insures good appearance at all times because horizontal lines match.

No industrial today can afford to ignore the savings Unitrol now offers in the installation and use of motor control

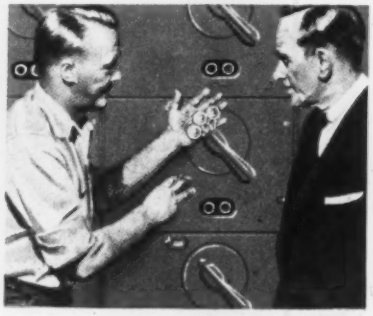
Cutler-Hammer Unitrol cuts costs from the moment it is delivered. It can save days, often weeks, in the time required for the installation of motor control. The high cost of mounting and wiring individual starters is eliminated. Earlier use of the production facilities brings a speedier return on the investment. Unitrol often effects vital savings in floor space, sometimes avoids the need for costly plant construction.

In performance, nothing can compare with the Unitrol. Feature after feature of the astounding Three-Star Control saves time and expense. Superlife vertical contacts *never* require maintenance care in all normal use. Adjustable overload relay coils let motors work harder safely, save the expense of both damaged motors and needless production interruptions. Full three-phase protection such as able engineers now demand is offered by three-coil overload relays.

Compare Unitrol with any other control centers and see the difference. See how sizes and types of control units can be interchanged in Unitrol without rearrangement of the entire assembly or the waste of space with dead panels. Saves time, saves space, saves money. Compare and you *too* will insist on Cutler-Hammer Three-Star Unitrol. Write or wire *now* for full information. CUTLER-HAMMER Inc., 1211 St. Paul Avenue, Milwaukee 1, Wisconsin.

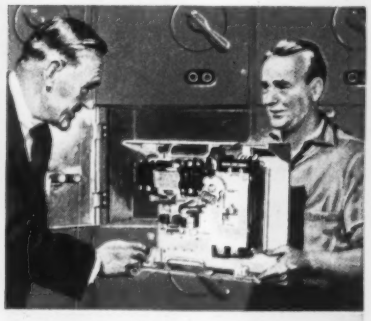
CUTLER-HAMMER
CONTROL
C-H

Unitrol plug-in feature disconnects control from power when unit is moved to test position, reconnects without misalignment when unit returns to operating position. Control panel is *always* vertical. Plug-in design permits back-to-back assemblies without staggering control units. Units are removed by merely disconnecting load and control wiring at terminal boards. This wiring is cabled, marked and color coded.



Unitrol provides either circuit breakers or fused disconnect switches of advanced design. Both have three-position self-aligning operators arranged for padlocking with as many as three locks in the "off" position. Recessed pushbuttons and concealed door hinges are typical features that add to safety and fine appearance.

The name UNITROL is a Cutler-Hammer trade mark



Components front of panel mounted without stacking. No crowding, no power connections near panel fasteners. Many Three-Star Control exclusives. Superlife vertical contacts *never* require maintenance expense in all normal control uses. Adjustable overload relay coils let motors work harder with safety. Full Three-Phase Protection with 3-Coil overload relays on standard size starter panels.

Cutler-Hammer Inc., Milwaukee, Wis. *Division:* Airborne Instruments Laboratory. *Foreign:* Cutler-Hammer International, C. A.
Associates: Canadian Cutler-Hammer, Ltd.; Cutler-Hammer Mexicana, S. A.; Intercontinental Electronics Corporation, Inc.

Allen B. Du Mont Laboratories Inc.

Industrial TV Sales

1958	$10,000,000
1957	5,000,000
1956	3,300,000
1955	2,100,000
1954	1,000,000

Estimated by Electronic Industries Association.

A Texas steel plant keeps tabs on operations by using . . .

Industry's Electronic Eye

SALES this year of closed circuit television for industrial purposes will nearly double 1957's, estimates the Electronic Industries Association, Washington (see table).

About 15 U. S. firms manufacture complete systems and equipment and about 15 more make components and accessories.

Makers Are Optimistic — Producers of closed circuit systems are enthusiastic about the future. Example: Radio Corp. of America, Camden, N. J., says the device can keep 24-hour watch over many industrial operations and in so doing promote safety and save time, money, and effort. The firm expects sales in 1958 to show a "substantial" increase over last year's.

Allen B. Du Mont Laboratories Inc., Clifton, N. J., describes future sales prospects as "overwhelming." General Electric Co., Schenectady, N. Y., says sales prospects are steadily improving and that closed circuit TV is becoming more and more accepted by industry.

Sales prospects promise steady growth, reports Dage Television Div., Thompson Products Inc., Michigan City, Ind. Blonder-Tongue Laboratories Inc., Newark, N. J., thinks 1958 will be one of the industry's biggest years. It claims TV equipment is being purchased as matter of factly as milling machines. Sharing the optimistic outlook, General Precision Laboratory Inc., Pleasantville, N. Y., observes that industrial sales account for about 50 per cent of the total TV market.

Some Uses—Closed circuit systems are installed in areas inaccessible to humans (such as danger zones, enclosed chambers, or areas hard to see from control positions). It helps in controlling operations and is proving useful in quality control.

Douglas Aircraft Co. Inc. uses closed circuit television in conjunction with a riveting machine at its El Segundo Div. The machine installs the H and Z section stringers to the A2D Skywarrior wing panels. Even though the operation is automatic, a close watch is needed to insure against damage to the drill, countersink, rivet sets, or rivet head milling cutter. By observing operations via TV, the operator can (by using pushbutton control) stop the machine quickly when necessary.

Sharon Steel Corp. uses it in its new $14 million slabbing and blooming mill at Farrell, Pa. Equipment has been installed at critical points to help operators maintain quality control by providing them with a closer look at key rolling and handling operations.

At Fairless Works of U. S. Steel Corp., closed circuit TV watches operations in the open hearth furnace. The camera, air and water cooled, can be aimed over the entire surface of the bath revealing any unevenness in melting. Object: The flame can be directed where needed most.

How It Began—Closed circuit TV reportedly was first used in government laboratories as an aid in handling radioactive materials. Today, it has a long list of applications.

In metalworking alone, applications increase as special needs develop and engineers adapt and devise equipment to provide solutions. Some uses: Reading gages, watching machine operations, monitoring load levels in bins and tanks, checking furnace burners and stacks, scanning material handling, making time study checks, making security checks at gates, speeding interplant and intraplant communications, transmitting drawings and photos.

For steelmaking, television can help control sintering, open hearth

bath and flame, and rolling mill operations.

Makeup of System—A basic system consists of a camera, coaxial cable, generator and monitor. The simplest cost from $1400 to $3000. Prices naturally increase with accessories (such as additional cameras and special lighting). Additions which can be made without obsoleting original equipment might include multiple lenses, remote control for panning, tilting, lens changing, iris settings, and focusing.

Although prospective users of closed circuit television often have men on their payrolls qualified to make the installations, the usual approach is through manufacturers of industrial TV or their authorized representatives. Installation or maintenance is made according to the user's wishes.

Innovations—The past year has brought some significant improvements in equipment. Worth noting are cameras that automatically adjust to light levels; cameras with built-in control units; more rugged cameras for operation in extreme environments; more reliable system components and a wider range of accessories. Also reported are successful experiments which indicate the feasibility of transmitting images over telephone circuits.

May Steel Payroll Up

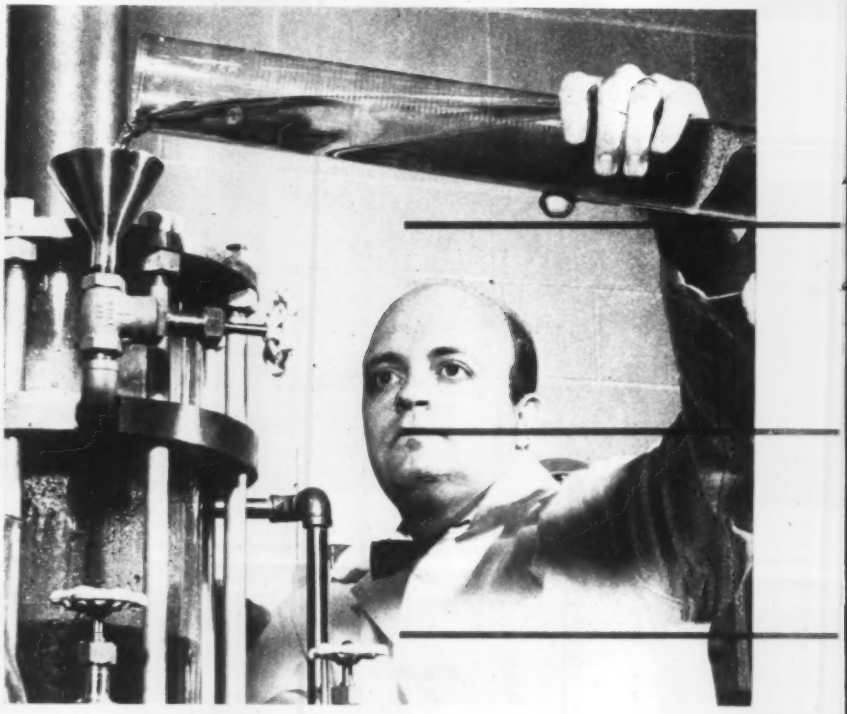
The May payroll for 94.9 per cent of the steelmaking industry was about 4.2 per cent higher than April's ($258 million, against $247.5 million) but was about 20 per cent under that in May of last year ($322 million), reports the American Iron & Steel Institute.

The average hourly payroll for steelmaking employees in May (representing the same 94.9 per cent) was $3.09 an hour, compared with $3.10 in April and $2.82 in May of 1957. Total employment of the reporting companies was 500,369, compared with 502,653 reported in April.

The steel industry's wage earners worked an average of 34.2 hours a week in May, against 33.1 in April.

The May payroll for the entire iron and steel industry was $270 million for 526,700 workers, the institute estimates.

Recession Spurring R&D



Survey indicates metalworking's outlays in 1958 are greater than 1957's. Behind the boost: A quest for new products to combat the slump. Basic researchwork drops

AMBLE through Armour Research Foundation's 350,000 sq ft of laboratories in Chicago. You'll find 1300 scientists, engineers, and staff people working on more than 750 research projects—about 3 per cent more than at this time last year.

Then tour the Matawan, N. J., labs of Hanson-Van Winkle-Munning Co. You'll find a reorganized and expanded technical staff searching for ways to make plating and polishing equipment that will lower unit production costs. The company doubled its R&D spending this year.

Those examples emphasize the role of research and development in metalworking's bid for better profits.

They're Not Alone—Of 100 leading companies checked by STEEL, 91 are spending as much or more for R&D this year than last. They're doing it to maintain (or improve) their competitive positions. To sell in today's market, they say, you have to tailor your product more to the customer's liking. Many report pressure from salesmen for more, new, different, and easy-to-sell items.

Also prodding the R&D budget upward is the desire to lower production costs as keen price competition forces selling prices down. Process improvement heads many companies' lists of target areas.

With some, high 1958 R&D expenditures reflect a continuation of projects started earlier. Because they show promise of widening next year's profit margin, the companies overrule postponement that would bring only short term savings.

Programs:

30%
are spending MORE

61%
are spending SAME

9%
are spending LESS

in 1958 vs. 1957

A few firms say they're pushing development in fields new to them. Their objective: Broaden product lines. Some are just beginning to move into the missile and nuclear fields. Others, like Alloy Steel Products Co., Linden, N. J., are developing components in anticipation of nuclear energy's breakthrough into commercial usage. More than half the nation's R&D is done by or for military agencies.

One company says its higher R&D spending "isn't entirely intentional." Reduced production volume freed engineers to explore ideas previously shelved. It has also transferred some production men to assembly of experimental models of new products.

Where Money's Going—Development, not research, is getting the most attention. Metalworking's prime targets:

- New product development.
- Improved product design (for cheaper production, longer life, easier use, more sales appeal).
- Process improvement.
- Materials—upgrading them.
- Tooling—lower its cost.
- Production facilities—up their efficiency.
- Waste products—make them useful.

Some Curtail—Nine respondents are cutting back their R&D spending. Reason: "We can't afford it." Kenneth Bartlett, president, Horizons Inc., Cleveland research organization, offers this explanation: "A manager is measured by the return on investment or profit per sales dollar his company makes. So during poor income periods, he'll cut back R&D spending to maintain a profit margin."

He adds: "R&D carries this obligation: If it's successful, the resultant new product or process should be exploited immediately. That often means investing in new capital equipment—an item some companies can't afford right now."

Brighter than Most — Armour's huge workload probably isn't typical of independent labs' current activity; some find their volume diminishing. Reasons: 1. Development, not research (the labs' prime work area), is industry's present target. 2. Companies are doing more of their own R&D. That's because lower production frees engineers from routine jobs to work on development.

The Big Push — Metalworking's spending for research and development nearly doubled from 1953 to 1956 (when it hit $4 billion), indicates National Science Foundation. The aircraft industry led the march. Primary metal producers hiked their outlays from $59.8 million to $87.9 million. Metalworking's 1958 outlays are estimated at $6 billion, vs. $5 billion last year.

Example of continuing R&D effort: Monsanto Chemical Co.'s total employment climbed 28.5 per cent in the last five years; the number of research personnel jumped 49.5 per cent. The St. Louis company is pouring $23.8 million into research this year, vs. $22.7 million last year.

Machine Control Is Hot—Hughes Aircraft Co., Los Angeles, boosted R&D spending 15 per cent this year. It's doing applied research on numerical control for machine tool transfer lines and single special machines (see STEEL, Mar. 31, p. 84).

Cross Co., Detroit, hiked its R&D budget 75 per cent this year (reflecting comparatively low 1957 spending but signaling a large '58 program). The company is developing static-element control systems for machine tools. They would replace mechanical switches, eliminating moving parts in the control panel. Static controls reduce machine downtime, offer great reliability, and have long working lives.

New Materials—Crucible Steel Co. of America's R&D spending is up 50 per cent this year reflecting work at its now wholly owned subsidiary—formerly Rem-Cru Titanium Inc. Tangible research results: Three new titanium alloys. Tagged "Formageable," they can be formed easily while in a solution treated condition, then thermally aged to high strength—one, a beta phase alloy, to a yield strength of 220,000 psi (see STEEL, July 14, p. 116).

Billions for Research

Interested in a $2.8-billion opportunity?

The Small Business Administration, Washington, says the federal government spent that sum for research and development in the 12 months ended June 30, 1958.

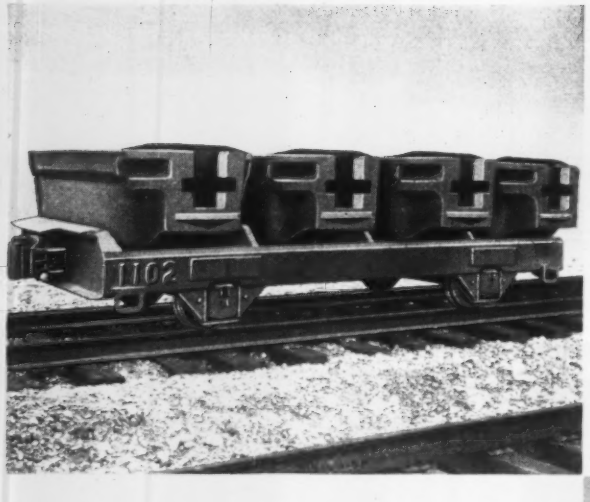
The Defense Department offers greatest possibilities for research contracts, says SBA. It adds: "Small firms interested in research work for the government should make their abilities known."

New Plant Upgrades Ore

The trend to greater supply of processed ores is gaining momentum. Steep Rock Iron Mines Ltd. reports it will supply ore containing 58 per cent iron and 6 per cent silica from a new $2,250,000 plant at Steep Rock, Ont.

The facility serves an underground mine at Errington, Ont. It will take in as much as 7000 tons of crude feed daily, including large tonnages previously discarded as waste. Capacity will be 5500 tons of improved ore a day.

A second plant, to serve the Hogarth, Ont., mine, will probably be operating in 1959.

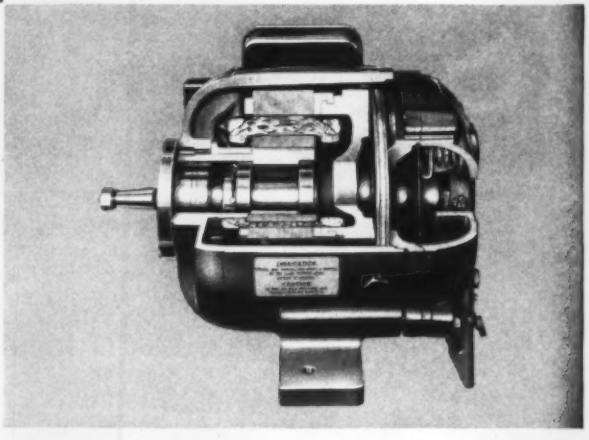


THE HEAVIER THE LOAD...

the more you need HYATTS . . . because nothing can compare with the cylindrical roller bearing for rugged, load-carrying capacity and continuous operation under adverse conditions. That's why leading steel mills specify HYATT Hy-Rolls for applications like these charging cars.

THE HIGHER THE SPEED...

the more you need HYATTS . . . because their internal clearances are stringently controlled for smoother operation. Built of the finest steels, HYATT Hy-Rolls operate with peak efficiency at high speeds as in this non-ventilated, continuous-duty textile loom motor.



THE MORE YOU NEED *Cylindrical* HY-ROLL BEARINGS

Today, as new industrial designs require heavier loads and higher speeds crammed into smaller housings, engineers are turning to HYATT Roller Bearings, America's most complete line of cylindrical roller bearings. They find their problems are solved quickly with bearings like the shouldered-race HYATT Hy-Roll that will handle heavy radial loads while taking a surprising amount of thrust. Contact your nearest HYATT Sales Engineer for recommendations—You'll find him a mighty big help! Hyatt Bearings Division, General Motors Corporation, Harrison, N.J.; Pittsburgh; Detroit; Chicago; Oakland, California.

THE RECOGNIZED LEADER IN CYLINDRICAL BEARINGS

1908–1958 GM FORWARD FROM FIFTY

HYATT HY-ROLL BEARINGS FOR MODERN INDUSTRY

Body by Fisher

If you're a potential supplier to General Motors' body division, here are tips on how to get the business. The Fisher operation, taken over by GM in 1926, is unique

GEORGE COOK, director of purchases for General Motors' Fisher Body Div., doesn't think there's anything unusual about his organization, but to its 7000 or more suppliers, it is unique.

It has full responsibility for purchasing or producing all components and varied materials that go into the bodies of GM cars. Its body assembly plants are usually adjacent to car division assembly plants; in many cases they're actually in the same building. But until the finished body rolls into the car division section of the plant, it's owned by Fisher Body.

Fisher's Role — Mr. Cook finds many suppliers still don't know where Fisher Body fits into the GM picture. "We got a letter the other day addressed to Mr. Wolfram (Oldsmobile's general manager). The writer said he had noticed that the headlining in his new Olds was a rubber material similar to that made by his company. He wondered if Mr. Wolfram would be interested in buying his product.

"That letter was written almost a month earlier and by the time it was rerouted through GM's procurement and scheduling group to us, the prospective supplier had wasted a lot of time and effort," says Mr. Cook.

Dear Sir — That isn't unusual. Many suppliers are vague about who buys what in the GM hierarchy. The tendency is to address a letter to the head of a division and hope that it will get to the proper source. Mr. Cook recalls one letter that said simply: "I have machinery and manpower. I'd like to manufacture something for your company."

History—Fisher Body was formed in 1908 by Fred and Charles Fisher. They started building wagon and carriage bodies and switched to selling automobile bodies to Cadillac in 1910. The firm pioneered in the mass production of closed bodies. General Motors bought a three-fifth interest in Fisher in 1919, and it joined GM officially in 1926.

Today, Fisher Body operates 11 stamping plants, 16 assembly plants, and four tooling, engineering, and research facilities. Two more plants fabricate upholstery trim (some of the assembly plants also do this work).

Nomenclature — To persons unfamiliar with the auto industry, the body is everything from the

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firewall and front windshield opening back to, and including, the rear bumper. Basically, the term covers the passenger seating package but does not include the hood, fenders, chassis, and drive train.

Sometimes, purchasing requirements reach such a fine point that side trim strips on Buicks or Chevrolets, for example, are bought by Fisher Body and put on the body right up to the edge of the front door. The additional 6 or 8 in. of trim spear on the front fender is installed by the car division with Fisher Body's approval.

Starting Point—Although its engineers sit in on preliminary GM styling and design confabs, the body division begins work when full-sized clay mockups come from central styling groups. Production designs evolve from the mockups, and prototype development gets underway. At the same time, body division engineers are deciding what materials to use and where to purchase them. Other engineers and toolmakers start building body dies.

It's a big responsibility from a purchasing standpoint because Fisher Body builds almost 80 different body styles each year. Each style has about 4000 parts which require special testing and attention. By making a single division responsible for all this work, GM obtains manufacturing economies and saves money in its buying.

Tons & Tons—Moving in and out of Fisher Body plants in an average year are: 1.5 million tons of steel, 261 million lb of glass, 3 million lb of aluminum, 87 million lb of rubber, 3 million lb of copper, 69 million lb of lead and zinc alloys, plus many pounds of fabrics, leather, and other materials.

If you want to sell to GM and don't know where to go, take Mr. Cook's advice. Write to Ray Vogel, who heads up GM's Procurement & Scheduling Div., General Motors Bldg., Detroit 2, Mich. Mr. Vogel's group will get your letter to the proper source in a few days. Letters addressed to GM's president, Harlow Curtice, will be a long time finding a purchasing agent's desk.

Role of the Small Car

With small car tooling already underway, Ford and General Motors still seem to be trying to justify building an American economy type car.

Detroit isn't sure that the apparently growing market for European imports means people will buy U. S.-built economy cars. But the industry is coming to believe that the upgrading of Ford, Chevrolet, and Plymouth has created three new market groupings in which the small car will have a definite place.

One of the industry's market research men told STEEL his concept of the regrouping. It justifies small car production in this country.

Upgraded — "First we have the luxury car market which is fairly stable. The second group is the medium price market, and let's face it, this now includes top-priced Fords, Chevrolets, and Plymouths because they cost more than economy buyers want to pay," he asserts.

The researcher thinks it is unlikely that economy buyers will become so hard pressed they'll want a cheap version of those three cars. That opens up a market for an economy car which is being filled by AMC's Rambler, S-P's Scotsman, and the imported jobs.

Furriners—In that market are a smaller number of persons who aren't as interested in economy as they are in foreign flavor. "Right now that group probably accounts for a third of the 300,000 foreign cars that will be sold here this year. Foreign appeal is a secondary consideration for most of the others," says the marketeer.

As the population expands and inflation continues to boost car prices, he thinks a greater percentage of car buyers will want an economy car, but the percentage of those who want a foreign car should remain pretty constant.

Outlook—"This means the economy (not small) car market can support a million sales by 1962-63 and most of them will be American type cars. Even with high domestic manufacturing costs, it should be a profitable venture for at least Ford and GM, even though they may lose money at first if they introduce the cars next year or even in 1960," he adds.

The hitch (apparently the one thing that's keeping GM from admitting it will introduce the car here) is a lack of complete proof that such reasoning is valid. "We believe this is what's happening, but this blasted small car market is still too new for us to get any real proof yet. We hope our market studies and this year's import sales will give us the data we need," concludes the researcher.

U. S. Auto Output

Passenger Only

	1958	1957
January	489,357	642,090
February	392,112	571,098
March	357,049	578,826
April	316,503	549,239
May	349,474	531,365
June	337,355	500,271
6 Mo. Total	2,240,850	3,372,889
July	.....	495,629
August	.....	524,354
September	.....	284,265
October	.....	327,362
November	.....	578,601
December	.....	534,714
Total	.....	6,117,814

Week Ended	1958	1957
June 14	78,163	125,372
June 21	84,396	118,805
June 28	92,277	125,909
July 5	35,273	73,682
July 12	73,846†	111,943
July 19	80,000*	117,205

Source: *Ward's Automotive Reports.* †Preliminary. *Estimated by STEEL.

Foreign Car Registrations

(First five months)

	1958	1957
Volkswagen	33,866	26,556
Renault	14,231	5,288
British Ford	10,866	4,414
Hillman	6,335	*
Fiat	5,887	*
MG	*	5,318
Metropolitan	*	4,056
All Others	56,904	21,060
Totals	128,089	66,692
Share of U. S. market	6.3%	2.7%

*Not in top five.
Adapted from R. L. Polk & Co. data.

Interstate Drop Forge Company—

20 Years a Cities Service Customer and Still Forging Ahead!

The modern way to cut a die is typified by die sinking machine, one of many at Interstate Drop Forge Company. All die sinking machines are lubricated by Cities Service lubricants.

With production running at roughly 1000 tons per month, Interstate Drop Forge Company of Milwaukee is one of the largest forging concerns in the Wisconsin area and growing all the time.

An integral part of this growth story, Cities Service is proud to have filled Interstate's lubrication needs for the past 20 years.

Drop hammers . . . helve hammers . . . upsetters . . . forging rolls . . . shapers . . . automatic metal saws. These are but a few of the diversified machines lubricated by specially tailored Cities Service oils and greases.

Actually, in a plant of this type with so many differing pieces of machinery, it would be possible to have as many as 25 different lubricants. But, Interstate, with the aid of their Cities Service Lubrication Engineer has been able to standardize on twelve Cities Service lubricants.

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Major advantages of this consumable electrode vacuum process steel are: *Superior cleanliness.* The melting process ends problems of contamination from three basic sources—crucible, air and slag. The water-cooled crucible is made of copper—does not contaminate. There is no air present. And no slag forms. Furthermore, gaseous impurities already in the electrode metal are drawn out by the vacuum during melting.

Better dispersion. Virtually segregation-free steel results because any remaining impurities are better dispersed throughout the steel.

The combination of superior cleanliness and better dispersion results in a more uniform steel of very high fatigue strength and ductility.

This cleaner, sounder steel produced by the consumable electrode vacuum process is ideal for vital aircraft, jet engine and other parts that must have steel that is exceptionally clean and strong.

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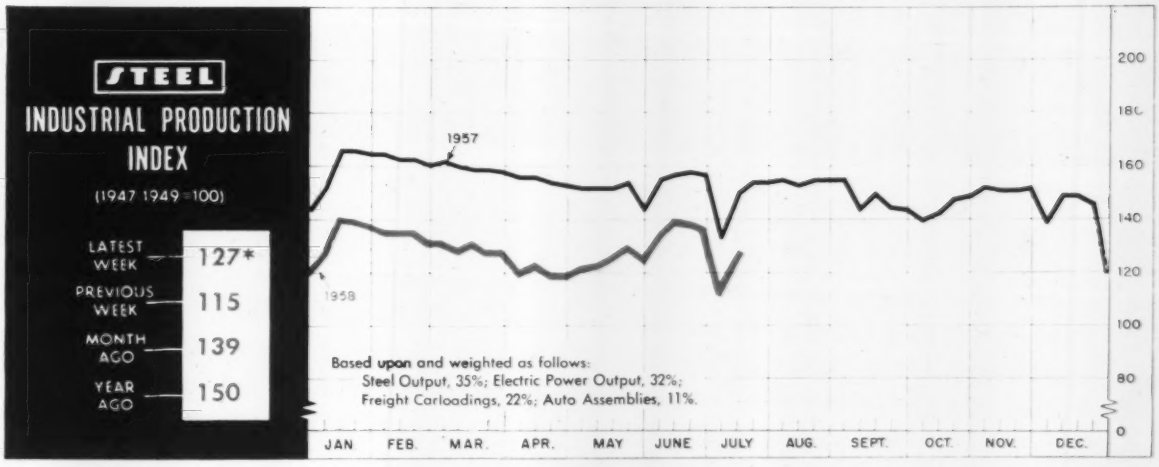

*Week ended July 12.

Summer Level To Be Above Recession Low

INDUSTRIAL PRODUCTION looks like it is going to ride out the rest of the summer a little above the halfway point between the year's high and low readings on STEEL's index. The index made up more than half the ground it lost during the Fourth of July holiday week. A preliminary 127 (1947-49 = 100) was posted during the week ended July 12 despite some fairly strong obstacles.

Auto production showed the effects of early model changeovers, and freight carloadings were weak because of the coal miners' holiday which began on June 28.

Outlook—Steel production is rising slowly. Last week the mills were scheduled at about 55.5 per cent of capacity, good for 1.5 million tons of steel for ingots and castings. That's almost 60,000 tons better than the previous week's production and will add more than a point to the index.

Output of electric energy is beginning to expand as the weather comes closer to seasonal normals. The indicator probably will fall short of the year-ago weekly totals this summer because of extended vacation periods in industry, but it will still be one of the strongest factors in industrial production.

Rail Outlook Dismal—Through the week ended July 5, cumulative railroad carloadings were almost 20 per cent behind the year-ago figure. The situation will not get much better before fall, largely because of the reduction in iron ore and coal loadings. But the resumption of shipping of coal following the miners' holiday will add strength to the index for the week ended July 19.

Despite an expected pickup in auto output following the July 4 shutdowns, the immediate future of the industry is cloudy. Assemblies of cars and trucks totaled about 89,000 units during the July 12 week, says *Ward's Automotive Reports*, and the figure probably rose slightly last week. There were no phaseouts scheduled, and some

BAROMETERS OF BUSINESS

	LATEST PERIOD*	PRIOR WEEK	YEAR AGO
INDUSTRY			
Steel Ingot Production (1000 net tons)[2]	1,515[1]	1,442	2,030
Electric Power Distributed (million kw-hr)	11,800[1]	11,150	11,964
Bituminous Coal Output (1000 tons)	1,250[1]	8,930	1,474
Crude Oil Production (daily avg—1000 bbl)	6,400[1]	6,427	6,882
Construction Volume (*ENR*—millions)	$559.0	$466.3	$325.5
Auto, Truck Output, U. S., Canada (*Ward's*)	98,040[1]	46,206	143,699
TRADE			
Freight Carloadings (1000 cars)	525[1]	458	692
Business Failures (Dun & Bradstreet)	292	335	190
Currency in Circulation (millions)[3]	$31,384	$30,975	$31,313
Dept. Store Sales (changes from year ago)[3]	+1%	−9%	+4%
FINANCE			
Bank Clearings (Dun & Bradstreet, millions)	$18,815	$26,110	$17,299
Federal Gross Debt (billions)	$276.0	$276.3	$272.9
Bond Volume, NYSE (millions)	$23.8	$25.1	$20.8
Stocks Sales, NYSE (thousands of shares)	12,510	13,334	13,246
Loans and Investments (billions)[4]	$95.3	$96.0	$88.2
U. S. Govt. Obligations Held (billions)[4]	$32.6	$32.4	$26.3
PRICES			
STEEL's Finished Steel Price Index[5]	239.15	239.15	239.15
STEEL's Nonferrous Metal Price Index[6]	195.9	196.0	216.6
All Commodities[7]	119.1	119.2	117.7
Commodities Other than Farm & Foods[7]	125.5	125.3	125.4

*Dates on request. [1]Preliminary. [2]Weekly capacities, net tons: 1958, 2,699,173; 1957, 2,559,490. [3]Federal Reserve Board. [4]Member banks, Federal Reserve System. [5]1935-39=100. [6]1936-39=100. [7]Bureau of Labor Statistics Index, 1947-49=100.

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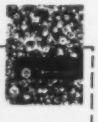

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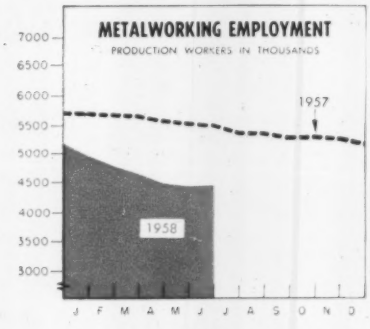
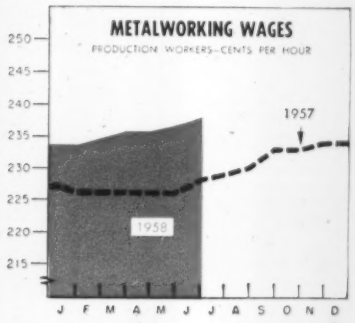
THE BUSINESS TREND



1957	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
June	1,095	893	1,274	852	1,404
July	1,075	869	1,207	848	1,373
Aug.	1,077	878	1,180	861	1,363
Sept.	1,061	878	1,186	879	1,278
Oct.	1,049	889	1,166	869	1,321
Nov.	1,029	887	1,141	852	1,350
Dec.	1,006	868	1,122	824	1,342
1958					
Jan.	957	833	1,097	792	1,276
Feb.	911	800	1,072	765	1,214
Mar.	885	786	1,090	749	1,153
Apr.	848	766	1,061	729	1,103
May*	843	757	1,030	717	1,077
June*	854	767	1,010	726	1,071

*Preliminary.
U. S. Bureau of Labor Statistics.
Charts copyright, 1958, STEEL.



1957	Prim. Mtls.	Fab. Prod.	Mach- inery	Elec. Mchy.	Trans. Equip.
June	247	218	230	206	240
July	252	218	230	205	241
Aug.	253	219	230	205	242
Sept.	256	222	232	207	246
Oct.	255	222	233	208	247
Nov.	255	223	234	210	250
Dec.	255	221	234	211	248
1958					
Jan.	256	222	234	212	246
Feb.	256	222	235	214	246
Mar.	257	223	236	214	248
Apr.	257	224	236	214	247
May	258	225	237	214	250
June*	259	226	237	215	251

*Preliminary.
U. S. Bureau of Labor Statistics.

plants idled for an extra week after the Fourth were back in operation. But at least two makers (Chrysler and Dodge) will close out 1958 model runs this week, and output will decline steadily after that until 1959 production gets up steam in September and October.

The balance sheet indicates that STEEL's index will do well to move above 130 points in July. The August level will depend on the relative strength and weakness of steel operations and auto production. It will probably be late September or early October before the 1958 peak of 139 is surpassed.

Employment To Stay Level

Little change is expected in the employment picture following the improvement reported for June by the Department of Labor. Seasonal increases in construction and agricultural employment will probably be canceled out by reductions in manufacturing work forces.

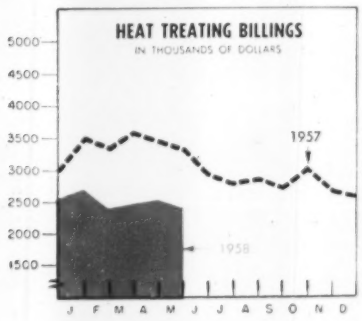
While both total and nonfarm employment rose significantly last month, metalworking did little more than hold its own (see chart above). The increase in the five principal classifications came to only about 4000. Small as that was, it still represents the first rise in well over a year of continuous decline in this industry.

While employment rose seasonally, so did unemployment and the total labor force. The rate of unemployment, seasonally adjusted, was 6.8 per cent last month, down from 7.2 per cent the month before —but 5,437,000 persons (a postwar record) wanted jobs and couldn't get them. One reason for the unusually heavy jobless figures is the steady rise in the civilian labor force. It reached a record 70.4 million in June, about 190,000 ahead of the previous record set in the corresponding year-ago month.

Inventory Cuts Continue

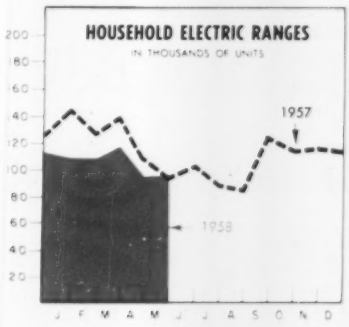
Inventory liquidation has gone a long way, but it isn't over, says the First National City Bank of New York. Prospects are for continued (but slower) reduction, with increased production making up for goods now being sold out of stock. The bank points out that total business inventories have dropped only 4 per cent below the peak, compared with 6.6 per cent in the 1948-49 recession and 5.5 per cent in 1953-54.

The June report of the Purchas-



	1958	1957	1956
Jan.	2,780.4	3,533.9	3,116.4
Feb.	2,436.4	3,378.9	3,124.8
Mar.	2,495.4	3,631.8	3,330.9
Apr.	2,542.6	3,572.4	3,166.2
May	2,421.5	3,389.6	3,350.7
June	.....	2,912.1	3,094.5
July	.....	2,767.5	2,737.4
Aug.	.....	2,830.8	3,136.6
Sept.	.....	2,708.8	2,858.6
Oct.	.....	3,021.6	3,468.5
Nov.	.....	2,641.4	3,238.2
Dec.	.....	2,565.4	2,998.9

Metal Treating Institute.



Total Factory Sales—Units

	1958	1957	1956
Jan.	109,000	144,500	143,600
Feb.	108,700	127,700	161,400
Mar.	117,900	139,400	163,100
Apr.	95,600	107,200	157,500
May	96,000	93,600	128,400
June	.....	102,300	129,800
July	.....	88,700	121,500
Aug.	.....	85,800	97,500
Sept.	.....	124,800	129,300
Oct.	.....	114,200	116,200
Nov.	.....	116,800	110,200
Dec.	.....	113,800	126,500
Totals	.....	1,358,800	1,585,000

National Electrical Mfrs. Assn.

ing Agents Association of Chicago points to further reductions. Asked how their current inventories compared with a year ago, 76 per cent replied lower, 16 per cent said the same, and only 8 per cent said higher. By the end of the year, 39 per cent said they would cut stocks even more, while 46 per cent said they would hold where they are, and 15 per cent said they would build stocks.

More Construction Records

The construction industry shows no signs of slowing down its comeback. June heavy construction contract awards set a record for that month at $1.9 billion, declares *Engineering News-Record*. Last month was the sixth period in a row to show improvement, resulting in a cumulative total of $9.6 billion for the first half. That's the second best figure on record (1956's first half was better) and was 2 per cent above the corresponding period of 1957.

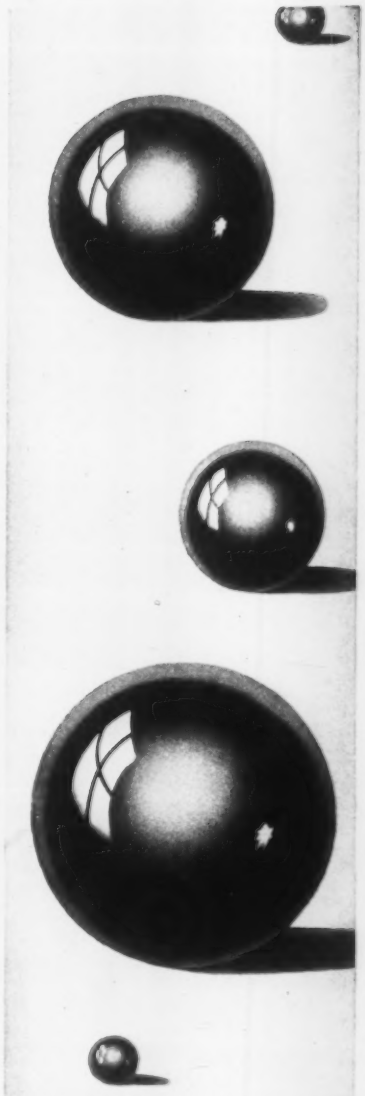
July is taking up where June left off. The $559 million marked up in the week ended July 10 represented the second best weekly total of the year, all the more remarkable because the week included only four business days instead of five.

Equipment Sales Better

The best month since last October was reported by the Foundry Equipment Manufacturers Association. New orders in May jumped to 136.1 (1947-49=100) from April's 88.7 mark. The May, 1957, level was 136.2. C. R. Heller, secretary-treasurer of the association, feels that some of the improvement was the result of the American Foundrymen's Society's show that month, but it would be difficult to trace all of it to that source.

Ordinarily, this index fluctuates wildly, being influenced by a small number of large orders. But because it has been riding along at a consistently low level since last November, this upswing is being regarded with more than casual interest in the industry.

The Material Handling Institute Inc. reports that new business for its members in May held at about the April level, totaling 118.04 per cent of the 1954 average. Industry spokesmen say their business has taken a definite turn for the better, with strong indications that dollar volume in the fourth quarter will top that of the 1957 period.



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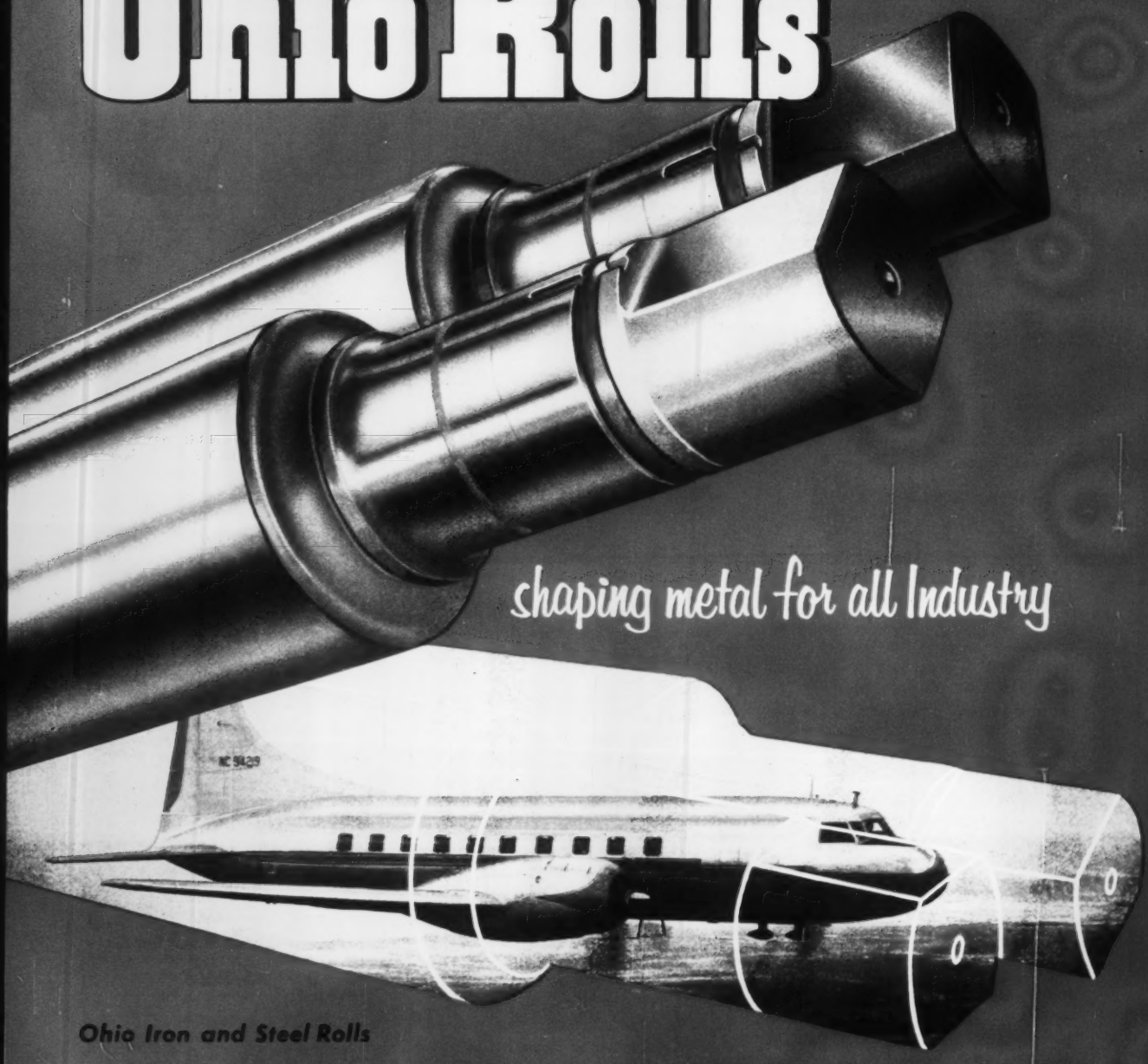
Ohio Rolls



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Ohio Iron and Steel Rolls

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THE OHIO STEEL FOUNDRY CO.

LIMA, OHIO

Plants at Lima and Springfield, Ohio

LIMA... Virtually at the center of the steel industry

OR10

CARL W. HUFLAGE
Cochran Foil v. p.

DR. P. WILLIAM BAKARIAN
R-N Corp. president

FRANK H. ROBY
joins Federal Pacific Electric

JAMES MEEHAN
new post at Brown & Sharpe

Carl W. Huflage was elected vice president, **Cochran Foil Corp.**, Louisville, subsidiary of Anaconda Co. He will direct sales and marketing of aluminum sheet, foil, and laminated foil.

Dr. P. William Bakarian was made president - general manager, **R-N Corp.**, New York, which is owned equally by National Lead Co. and Republic Steel Corp. **J. S. Breitenstein** was named vice president-administration; **Rollin P. Smith**, vice president-engineering. Mr. Bakarian, who succeeds **Alex Stewart**, retired, was president of Cramet Inc., Chattanooga, Tenn. Cramet, a jointly owned subsidiary of Republic Steel Corp. and Crane Co., terminated operations and returned its plant to the government several months ago.

Karl W. Galliger, engineering director, **New York Air Brake Co.**, was appointed manager of engineering, Watertown, N. Y., division. He replaces **John A. Vaughan**, resigned.

Charles W. Sinclair was made vice president-engineering for all divisions of **Kelsey-Hayes Co.**, Detroit. He was chief engineer, automotive division.

Patrick Bradley was made manager of distributor sales, **American Hoist & Derrick Co.**, St. Paul.

Myron Baldwin was made manager, instrument division, **Beckman & Whitley Inc.**, San Carlos, Calif. He continues as sales manager for meteorological systems and high-speed research cameras.

Frank H. Roby was elected an executive vice president, **Federal Pacific Electric Co.**, Newark, N. J. He was vice president, Square D Co.

Keith J. Brownell was made vice president-sales, bearing division; **Martin L. Brody**, sales manager, bearing division, **McGill Mfg. Co. Inc.**, Valpariso, Ind.

Harley T. Pyles was elected vice president - treasurer; **W. Bradley Blair**, vice president-sales, **Fairmont Aluminum Co.**, Fairmont, W. Va., subsidiary of Cerro de Pasco Corp.

Robert P. Thomsen was made sales manager, **Dollinger Corp.**, Rochester, N. Y. He succeeds **Lewis L. Dollinger Jr.**, recently elected president.

J. P. Gasser was elected executive vice president of **Dresser Industries Inc.**, Dallas. He was executive vice president, Seaboard Oil Co.

John M. S. Hutchinson joined **Bendix Aviation Corp.**, Detroit, as staff assistant to the president on manufacturing activities. He was vice president, assistant to the president, Perkin-Elmer Corp., which he joined in 1955. Previously he served with Chrysler Corp.

American Can Co. appointed new presidents for its subsidiaries, **Sun Tube Corp.** and **Bradley Container Corp. Kenneth M. Leghorn** is president of Bradley, with headquarters in Maynard, Mass. Former president of Sun Tube, Hillside, N. J., he is succeeded by **Joseph D. Martin**, executive vice president.

Brown & Sharpe Mfg. Co., Providence, R. I., announces sales appointments in its machine tool division, effective Aug. 18. **James Meehan** was made assistant to the general sales manager. He was director of grinding machine sales, and is succeeded by **Alfred R. Sparrow**, formerly director of screw machine sales. **Walter W. Appleton**, former district sales manager in Canada, succeeds Mr. Sparrow. **Ronald C. Smith** was made sales representative in Canada. **Duncan J. Brown** was named director of milling machine sales, effective June 23.

Square D Co., Detroit, appointed **Robert E. King** distribution equipment sales manager, effective Aug. 1. He succeeds and will report to **Mitchell P. Kartalia**, recently made marketing division general manager.

J. R. Dempsey was appointed a vice president, **Convair Div.**, General Dynamics Corp., San Diego, Calif.

Lee Fister succeeds **LeRoy V. Black**, retired, as superintendent, electrical department, **Bethlehem Steel Co.**, Bethlehem, Pa.

SKF Industries Inc., Philadelphia, named **Brendan J. Fraher** eastern regional manager; **Richard S. Overton**, director of marketing, sales division. Mr. Fraher succeeds **E. M. Ogle**, named to the new post of manager of ball sales.

R. C. McDonald was made New York district manager, **Clark Bros. Co.**, Olean, N. Y., one of the Dresser Industries. He succeeds **Robert J. Spears**, now assistant general sales

C. V. FRYLING

E. A. RANDICH

Allegheny Ludlum Steel appointments

JACK T. WELCH

WILLIAM I. WILT

Sheffield Corp. vice presidents

manager, transferred to the Olean home office.

C. V. Fryling was named product manager, electrical alloy materials, **Allegheny Ludlum Steel Corp.**, Pittsburgh. **E. A. Randich**, supervising engineer, specifications section, was appointed chief mechanical engineer, general engineering division. **Edward W. Schnabel** was named manager, tool and die materials, St. Louis district sales office.

W. Drury Clark was elected president, **Simplex Machine Tool Corp.**, Milwaukee. He was acting president. **J. A. Elwood**, factory manager, and **P. O. Wernicke**, chief engineer, were named vice presidents.

Leston Faneuf was elected chairman and re-elected president, **Bell Aircraft Corp.**, Buffalo. **Harvey Gaylord** was elected senior vice president, a new post. He is president of Bell Helicopter Corp., subsidiary in Ft. Worth, Tex. **W. M. Smith** and **J. H. vanLonkhuyzen** were made assistant vice presidents.

Claude A. Marlowe was elected vice president of **Treesdale Laboratories** and **Textile Processing Co.**, Mars, Pa. He continues as general manager, Pittsburgh Metals Purifying Div.

Robert C. Downie was made assistant to the president of **National Electric Products Corp.**, Pittsburgh. He will handle procurement relations with government agencies and contractors engaged in rocket and missile work. He was assistant general manager and assistant to the president of Superior Steel Corp., prior to its merger with Copperweld Steel Co.

Sheffield Corp., Dayton, Ohio, subsidiary of Bendix Aviation Corp., appointed **Jack T. Welch** vice president-field sales; **William I. Wilt**, vice president-gage and instruments division. Previously, both were assistant vice presidents of their divisions. **Victor J. Boll** was made assistant vice president, contract manufacturing division, advancing from general manager of the division. **Thomas W. Clark** was made assistant vice president, service facilities division. He was general manager of the firm's out-of-Dayton plants.

Chrysler Corp., marine and industrial engine division, Detroit, named **Raymond C. Davis** to the new post of director, planning and production control; **Bruce B. Spratling** to the new post of parts sales manager; **Glenn E. White**, division comptroller.

Hevi-Duty Electric Co., Milwaukee, announces additions to its furnace staff, subsequent to acquisition of the industrial furnace division of Eclipse Fuel Engineering Co. **Richard Hayden** was placed in charge of gas furnace sales. He was head of the division at Eclipse. **Norman Acker**, superintendent of the furnace manufacturing shop at Eclipse, will perform liaison work between the engineering, sales, and production departments at Hevi-Duty. **William Swanson** was made a sales and service engineer.

Joseph Meisler was made technical commercial manager, cryogenics department, **Philips Electronics Inc.**, Mt. Vernon, N. Y.

Charles W. Parker Jr. fills the new post of sales promotion director, industries division, **Allis-Chalmers Mfg. Co.**, Milwaukee.

Oakite Products Inc., New York, appointed **William A. Baltzell** industrial sales manager. **Dr. Clarence Bremer**, former director of research, was made technical director.

F. A. Huhn was made assistant vice president-accounting, **United States Steel Corp.**, Pittsburgh.

Douglas C. Bielenberg was made distributor sales manager for **Pheoll Mfg. Co.**, Chicago. He was with National Cash Register Co.

Clare E. White was elected president and chief operating officer, **Ungava Iron Ores Co.**, Montreal, Que. He was general manager, United Keno Hill Mines Ltd., Elsa, Yukon Territory.

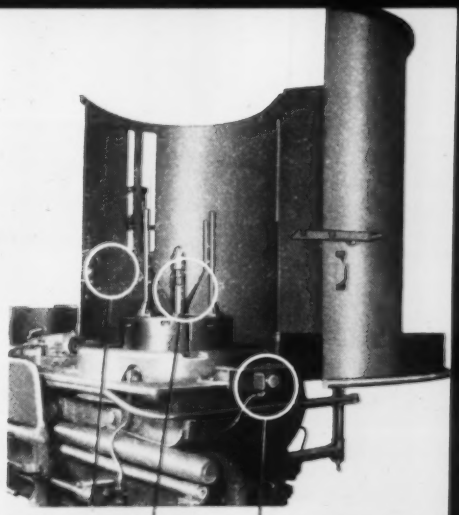
Robert R. Pierce was named manager, corrosion engineering products department, **Pennsalt Chemicals Corp.** In charge of manufacturing, sales and development, he has headquarters in Natrona, Pa.

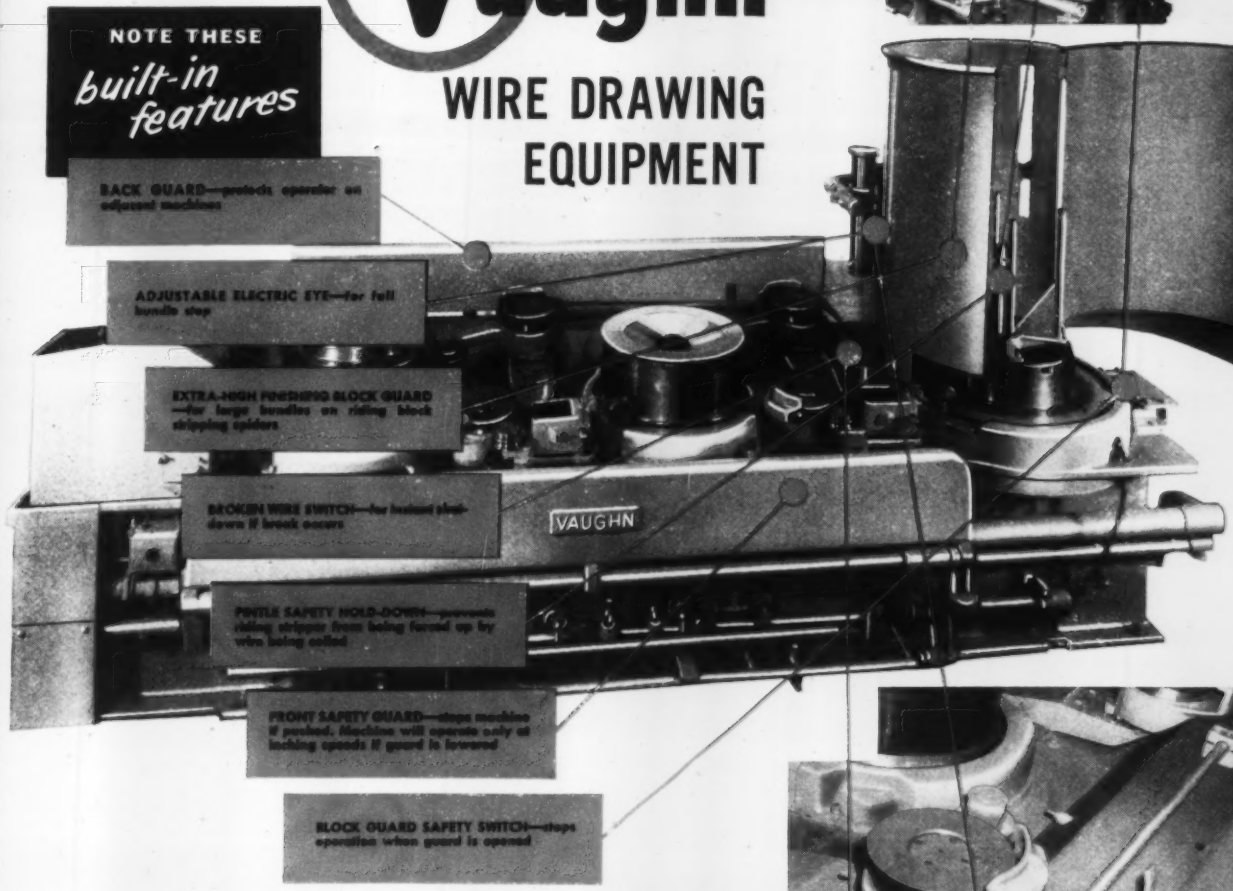
Copeland Refrigeration Corp., Sidney, Ohio, appointed **B. W. Moreland** general manager of manufacturing.

Robert H. Chirgwin was elected vice president-sales, **Dynatron Corp.**, West Hartford, Conn.

William G. Everingham was made manager of **Chevrolet Motor Div.'s** V-8 engine plant, Flint, Mich., General Motors Corp. He succeeds **Major W. Clark**, retired. **Bernard T. Christy** succeeds Mr. Everingham as operations manager of the 6-cylinder motor plant. **William J. Mas-**

HOW SAFETY matches SPEED IN Vaughn WIRE DRAWING EQUIPMENT

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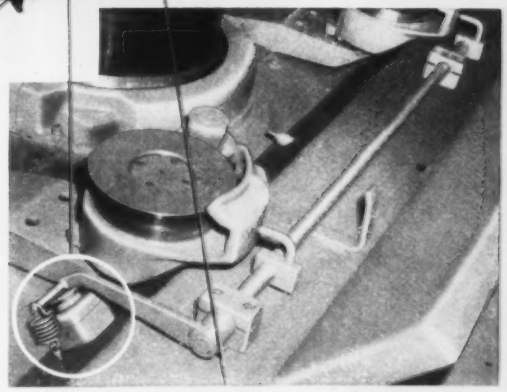
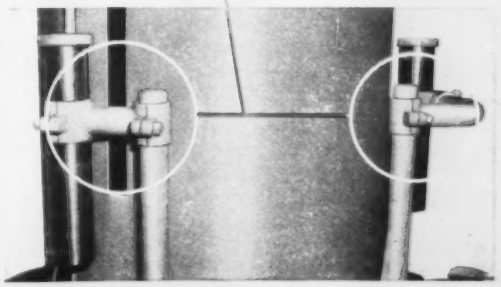
built-in features
BACK GUARD—protects operator on adjacent machines
ADJUSTABLE ELECTRIC EYE—for full bundle stop
EXTRA-HIGH FINISHING BLOCK GUARD —for large bundles on riding block stripping spiders
BROKEN WIRE SWITCH—for instant shut-down if break occurs
PIVOTED SAFETY HOLD-DOWN—prevents riding stripper from being forced up by wire being pulled
FRONT SAFETY GUARD—stops machine if pushed. Machine will operate only at inching speeds if guard is lowered
BLOCK GUARD SAFETY SWITCH—stops operation when guard is opened
VAUGHN



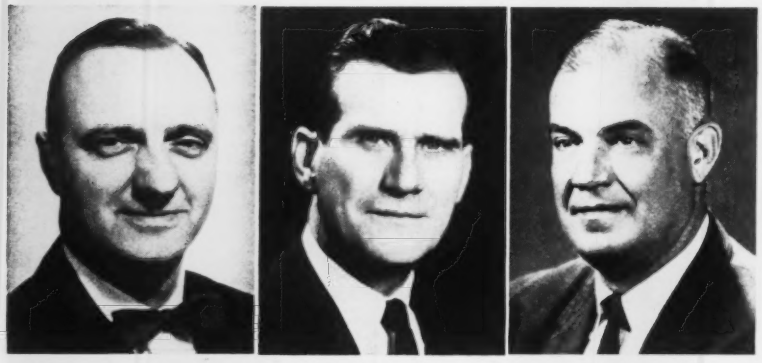


SAFETY for men and equipment is engineered thoroughly into Vaughn Wire Drawing Machinery—in every type, in every model. The high operating speeds of modern Vaughn machines are *safe* speeds because of this engineering. Our Motoblox, Motoblocs, Ringblox and other equipment are designed to match *productivity with protection* over the widest range. Let us detail our many safety developments, at your convenience.

"Quick on the Draw!"

The VAUGHN MACHINERY COMPANY
CUYAHOGA FALLS, OHIO

COMPLETE COLD DRAWING EQUIPMENT—Continuous or Single Hole . . . for the Largest Bars and Tubes . . . for the Smallest Wire . . . Ferrous, Non-Ferrous Materials or their Alloys.



EARL W. MAHANEY
Youngstown Sheet & Tube post

ROBERT J. LINNEY
Reserve Mining exec. v. p.

JOHN L. DAWSON
J&L dept. supt.-Aliquippa

H. T. THOMPSON
Standard Screw sales post

PAUL M. SCHAEFER
Wheeling Steel plant supt.

A. F. FINKL
A. Finkl & Sons v. p.

sey Jr. was made operations manager, Detroit forge plant, succeeding **John G. Moorhead**, retired.

Standard Screw Co., Bellwood, Ill., promoted **H. T. Thompson** to sales manager, standard fastener products, for its division, Chicago Screw Co. **E. L. Claussen** was made vice president in charge of Stanscrew sales; **R. W. Grady**, sales manager, standard fasteners, Hartford Machine Screw Div. **W. J. Cox** continues sales supervision of Stanscrew for the division, Western Automatic Machine Screw Co.

Rear Adm. Mitchell D. Matthews, USN, ret., was made manager of the service and repair division of **De Laval Steam Turbine Co.**, Trenton, N. J.

John A. Grimes was made general manager, test equipment division, **Consolidated Diesel Electric Corp.**, Stamford, Conn.

James M. Arnold was made vice president-general manager, **Recordak Corp.**, New York, subsidiary of Eastman Kodak Co.

Paul M. Schaefer succeeds **R. A. Swift**, retired, as superintendent of **Wheeling Steel Corp.'s** byproduct coke plant in Follansbee, W. Va.

A. F. Finkl was appointed vice president-national sales, **A. Finkl & Sons Co.**, Chicago. He succeeds **E. H. Graham**, elected executive vice president.

Jack W. Burtch was elected president, **Ohio Galvanizing & Mfg. Co.**, Niles, Ohio. He succeeds the late **W. R. Robinson.**

Joseph W. Ashley was made St. Louis district sales manager, **Consolidated Electrodynamics Corp.**

William B. Bernstrom was made manager, appliance and equipment market, **Reynolds Metals Co.**, Richmond, Va.

International Business Machines Corp., New York, named as vice presidents: **McLain B. Smith**, assistant general manager, data processing division; **James W. Birkenstock**, director of commercial development.

Earl W. Mahaney was made chief metallurgist, Indiana Harbor Works, East Chicago, Ind., **Youngstown Sheet & Tube Co.** He succeeds **Myron A. Jones**, named metallurgical engineer to serve under **E. S. Steigner**, supervisor of service engineering. Mr. Jones's headquarters are at Indiana Harbor Works.

Robert J. Linney, vice president-operations, was elected executive vice president, **Reserve Mining Co.**, Silver Bay, Minn. **W. M. Kelley**, former president, has retired from active business, but continues as a director. The office of chairman has been abolished. An official of Republic Steel Corp. and an official of Armco Steel Corp. will alternate each year as president. **C. M. White**, chairman of Republic, will serve for the ensuing year.

John L. Dawson was made superintendent, blooming, hot strip, and rolling mills department, Aliquippa, Pa., Works, **Jones & Laughlin Steel Corp.** He succeeds the late **Lewis C. Sowell.**

OBITUARIES...

Dr. Samuel W. Martin, 47, a vice president of **Great Lakes Carbon Corp.**, New York, and general manager, research and development department, died July 10.

Roy C. McKenna, 75, chairman, **Vanadium - Alloys Steel Co.**, Latrobe, Pa., died July 12.

James H. Ward, vice president, **Bethlehem Steel Corp.**, New York, died July 12.

Fred W. Schlichter, 52, president, **Hamilton Tool Co.**, Hamilton, Ohio, died July 4.

E. R. Bonnist, 62, advertising director, **Cooper-Bessemer Corp.**, Mt. Vernon, Ohio, died July 6.

Edward A. Courter, 52, vice president, **Turner Construction Co.**, New York, died July 5.

Clayton W. Work, sales promotion manager, instruments and controls division, **Hagan Chemicals & Controls Inc.**, Pittsburgh, died June 19.

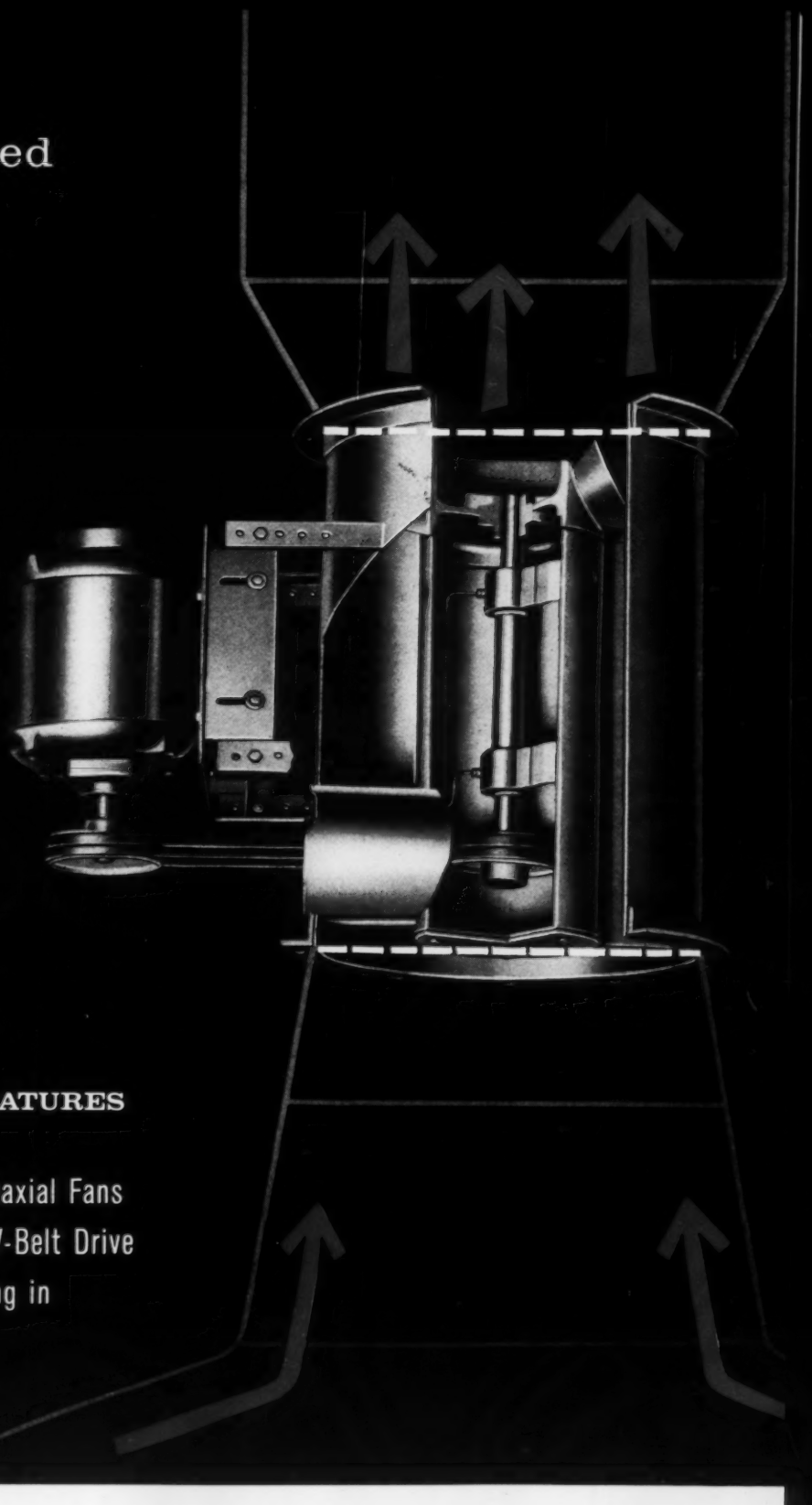
When you need

axial flow fans

for exhaust of fumes and vapors...

FOR
STANDARD AIR
CORROSIVE GASES
ELEVATED TEMPERATURES

Specify Westinghouse Tubeaxial Fans complete with motor and V-Belt Drive ready for "in-line" mounting in duct or stack



Call your nearest Sturtevant Division Sales Engineer, or write Westinghouse Electric Corporation, Dept. G-11, Hyde Park, Boston, Massachusetts.

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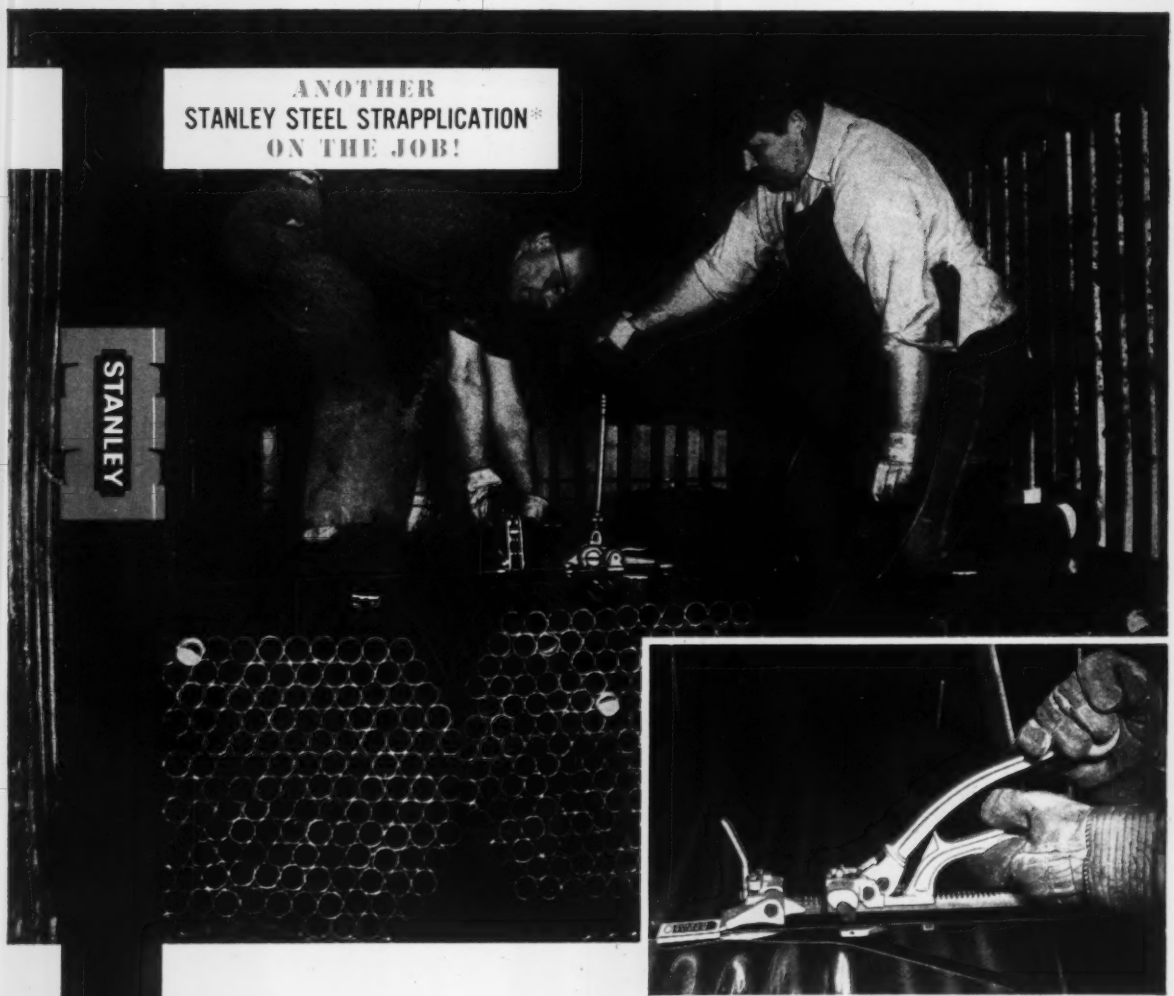
YOU CAN BE SURE... IF IT'S Westinghouse

ANOTHER
STANLEY STEEL STRAPPLICATION*
ON THE JOB!



Tubing Company Field-Tests Many Tools . . .

Selects the New STANLEY HDX TIGHTENER!

Competing with tools of 3 major manufacturers in field tests conducted by The Toledo Steel Tube Company, STANLEY'S NEW HEAVY DUTY PUSHER TYPE TIGHTENER came out on top!

Toledo's Shipping Foreman, Joseph Manuszak, says, "We made the right choice. The smaller base of Stanley's HDX Tightener makes it easy to use on units with small diameters or narrow surfaces. It can be quickly adjusted for use with strapping of different gauges. Since using The Stanley Steel Strapping System —and the HDX Tightener—in packaging our tubing, we've had no complaints of product damage in transit."

WRITE FOR COMPLETE INFORMATION *on The Stanley Steel Strapping System and steel strapping tools and equipment to STANLEY STEEL STRAPPING, Division of The Stanley Works, Dept. G, 1301 Corbin Ave., New Britain, Conn.*

The systematic way to solve specific packaging and shipping problems.

STANLEY **INSURE IT - SECURE IT WITH STANLEY STEEL STRAPPING**

AMERICA BUILDS BETTER AND LIVES BETTER WITH STANLEY

STANLEY

This famous trademark distinguishes over 20,000 quality products of The Stanley Works—hand and electric tools • drapery, industrial and builders hardware • door controls • aluminum windows • stampings • springs • coatings • strip steel • steel strapping—made in 24 plants in the United States, Canada, England and Germany.

Steel Mills Prepare for Upturn

Expansion and modernization programs being completed and planned assure fabricators of ample sources of improved products. Progress continues despite recession

STEEL PRODUCERS are improving their facilities to meet increasingly rigid requirements of their customers. At the same time, they are expanding their capacities in anticipation of much larger demand in the next decade. The present business setback has not halted programs which were underway nor seriously hampered the launching of new projects.

Jones & Laughlin Steel Corp. has resumed operations at its Cleveland Works following completion of an $82-million program (STEEL, Feb. 10, p. 73). Capacity to produce cold-rolled sheets at this plant has been doubled.

United States Steel Corp. says a second continuous tube mill will be built at National Tube Div.'s plant at Lorain, Ohio. Construction work on the first mill was started in May and is scheduled for completion by 1961. It will have an annual capacity of 237,000 tons of finished pipe (STEEL, May 12, p. 73).

The corporation's Columbia-Geneva Div. is operating the third new high-speed electrolytic tinning line at its Pittsburg, Calif., plant. The other two started producing in 1948 and 1953. The new facility employs the latest devices for product and quality control, including nuclear radiation and photoelectric detectors and gages. Other innovations include a built-in data collecting system which provides a continuous recording of the thickness of both the steel and the tin coating, and other data to insure output of a uniform product. It can supply tin plate for shipment in coils as well as cut lengths.

Kaiser Steel Corp. has completed installation of an 86-in. hot strip mill at its Fontana, Calif., plant. It includes three furnaces to preheat steel slabs prior to rolling, a scale breaker to prepare heated slabs for rolling, and 11 roughing and finishing rolling stands arranged in tandem.

"This new mill is one of the most important facilities in the company's current $214-million expansion program," says J. L. Ashby, vice president and general manager. "It not only means that more hot-rolled sheets and strip will be available for western builders, manufacturers, and fabricators, but it also will result in substantially increased capacity from Kaiser Steel's plate mill." The hot strip mill formerly was dependent on the plate mill for partially rolled slabs; the new mill makes more rolling time available for plate production.

Still under construction are three basic oxygen furnaces, a fourth blast furnace, 90 coke ovens, a slabbing mill, and an enlargement of the plate mill. The expansion will virtually double Kaiser Steel's capacity from 1,536,000 to 2,933,000 ingot tons a year.

Lukens Steel Co. completed the first major phase of its $33-million expansion program as massive new soaking pits began heating ingots weighing up to 75 tons each. Other facilities to be completed by the spring of 1959 include an electric furnace which will raise the firm's ingot capacity by some 25 per cent to 930,000 tons a year and a 140-in. rolling mill which will raise its rolling capacity by some 40 per cent. A total of nine pits, each capable of holding up to 200 tons of ingots, make up the new soaking pit battery at Lukens.

Lukens has also completed work on what the firm claims to be the heaviest spun and pressed heads ever formed. Two heads, each weighing 22,540 lb and measuring 7 ft in diameter, were made from plate 6-9/64 in. thick. Four heads, each weighing 16,340 lb, were made on a press that exerts a force of up to 4 million lb. Each of these heads was 71.75 in. in diameter and was made from plate 7 in. thick. Lukens' 206-in. mill rolled the carbon steel ingots from which these record-setting head shapes were formed.

National Steel Corp. has enlarged sintering facilities at plants of its subsidiaries, Weirton Steel Co. and Great Lakes Steel Corp. The new plant at Weirton with capacity of more than 6000 tons a day has been placed in operation. The sintering machine is 12 ft wide and 147 ft long. A still larger machine (12 ft by 153 ft) will be placed in operation Aug. 1 at Great Lakes.

Plans Stamping Plant

Metals Engineering Corp., a recently organized $1-million firm, is establishing a metal stamping plant at Greeneville, Tenn. It is scheduled to be in production this fall. Departments will include: Drill press, diecasting, tool and die, and foundry. Robert C. Austin is president. A. T. Wright heads up engineering.

To Close Duluth Plant

Western Electric Co., New York, plans to shut down its Duluth plant by Sept. 30. Alvin Jacobs, plant superintendent, says the decision was forced by a drop in demand for the plant's output, brought on by the nationwide recession.

GE To Build Laboratory

General Electric Co., Schenectady, N. Y., plans to construct a $1-million high voltage laboratory at Philadelphia. The research and development facility will be in addition to the $10-million switchgear laboratory at 76th Street and Lindbergh Boulevard, that city, which was completed in 1952.

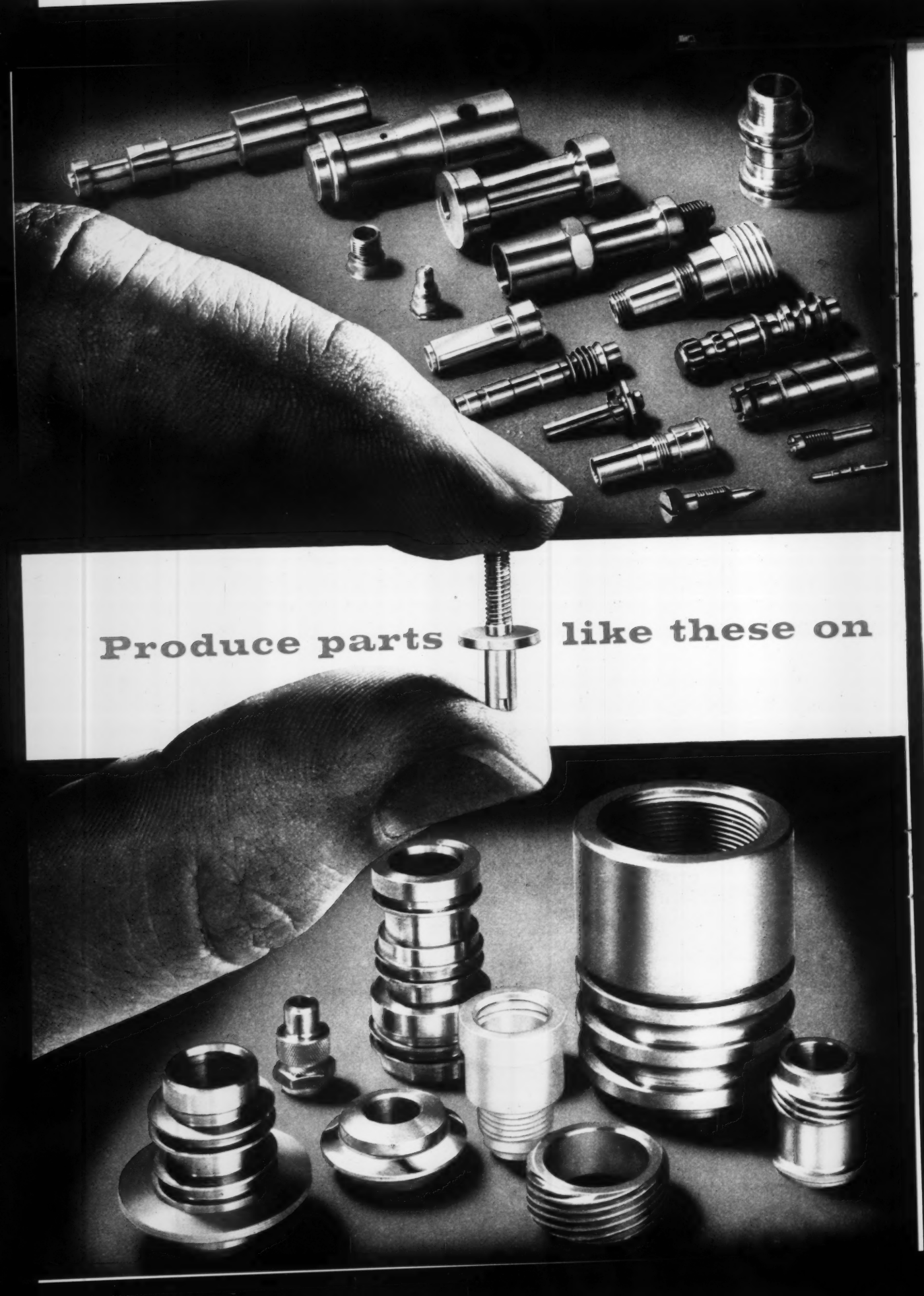
Enlarges Birmingham Plant

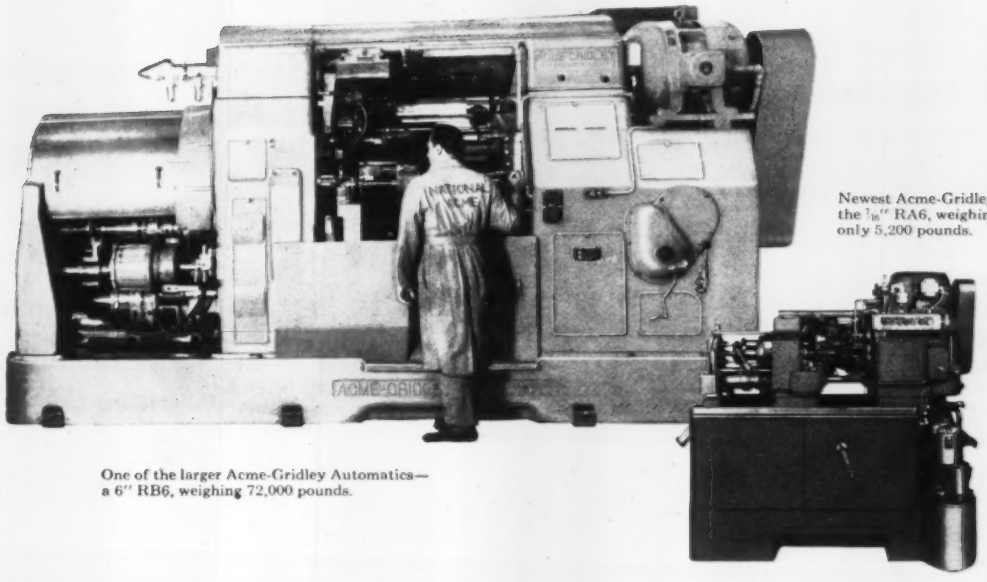
Fontaine Truck Equipment Co. Inc., Birmingham, is completing a $150,000 expansion, adding 40,000 sq ft of manufacturing space. It recently installed facilities to make dump bodies and dump trailers.

Shell Oil To Build

Shell Oil Co., New York, has launched expansion and development of its lubricating oil manufacturing facilities to double production of high viscosity oils. The program's unofficial cost estimate: $40 million. The project will include a vacuum fractionating unit and a phenol solvent extraction plant. Facilities to separate wax and asphalt

(*Please turn to Page* 102)


Produce parts like these on



Newest Acme-Gridley—the 1/16" RA6, weighing only 5,200 pounds.

One of the larger Acme-Gridley Automatics—a 6" RB6, weighing 72,000 pounds.

ACME-GRIDLEY automatics...

FORGET SECONDARY OPERATIONS!

Most parts machined on Acme-Gridleys are *completed* on Acme-Gridleys. Using these Automatics, you eliminate costly rehandling and, in many instances, avoid a sizeable second-machine investment.

The advantage applies to parts weighing fractions of ounces or hundreds of pounds. And the wide-open tooling zone of every Acme-Gridley lends itself to a broad range of installations limited only by the tool engineer's ingenuity. It means that, for sheer capacity range, no line of automatic production equipment in the world equals Acme-Gridley.

If you produce parts like the ones illustrated, then Acme-Gridley Automatics must be in your present plans. Our representative can give you expert assistance without obligation.

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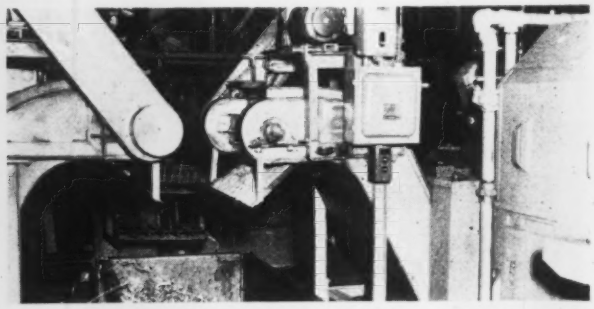
MAY-FRAN CHIP-TOTES



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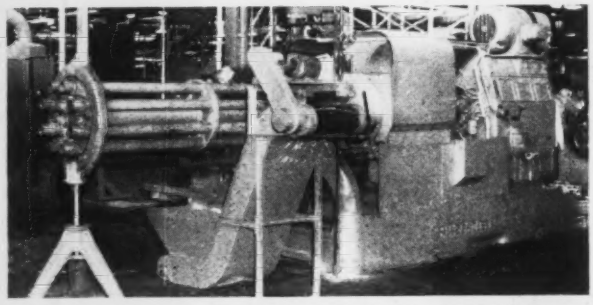
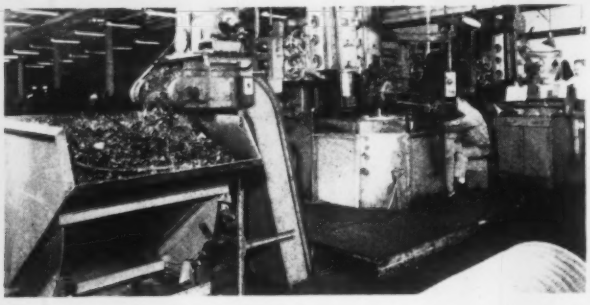
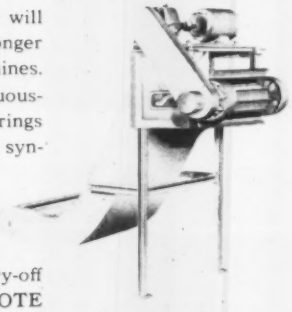


CONTINUOUS SCRAP REMOVAL



FROM ALMOST EVERY TYPE AND SIZE OF MACHINE TOOL

Here is a machine tool accessory that will cut production costs, and permit longer "run" times for your automatic machines. The MAY-FRAN CHIP-TOTE continuously removes the chips, turnings and borings from machines. The conveyor can be synchronized with the metal removing capacity of the machine. Scrap is channeled onto the CHIP-TOTE belt, carried clear of the machine for discharge into tote box or carry-off conveyor system. There is a CHIP-TOTE for every machine tool.



MAY-FRAN ENGINEERING, INC.

1725 Clarkstone Road, Cleveland 12, Ohio

For complete facts, write today and ask for MF-640.

(*Concluded from Page 99*)

from petroleum will also be improved and expanded. Future plans call for construction of units to purify waxes.

Fulton Tubing To Build

Fulton Tubing Co. is building a plant at Archbold, Ohio. The firm is a division of Higbie Mfg. Co., Rochester, Mich.

Broadens Heating Services

Lindberg Steel Treating Co., Melrose Park, Ill., acquired the processing facilities of the flame hardening department of Metal Improvement Co., Los Angeles. These have been integrated into the selective heating services of Lindberg's branch at 2910 S. Sunol Dr., Los Angeles.

Buys Wooldridge Div.

Curtiss-Wright Corp., New York, purchased the Wooldridge Div., Sunnyvale, Calif., from Continental Copper & Steel Industries Inc., New York. The earthmoving equipment manufacturing operations will be transferred to Curtiss - Wright's South Bend (Ind.) Div.

Ferro Expands Further

Ferro Corp., Cleveland, plans to expand its Fiber Glass Div. at Nashville, Tenn., and Ferro Enamel S. A., Sao Paulo, Brazil. The program will cost about $500,000.

Fairless To Get Big Crane

Alliance Machine Co., Alliance, Ohio, is constructing a 525-ton ladle crane for U. S. Steel Corp.'s Fairless Works, Fairless Hills, Pa. Alliance officials say the ladle crane will be the largest in existence. By using special alloy steels, the crane can be installed on runways now carrying 450-ton cranes. Construction features include: Auxiliary trolley equipped with 100-ton hoist and 25-ton auxiliary hoist; main hoist of interlock drum type, synchronized worm drive, equipped with two motors; main trolley equipped with 16 track wheels; main hoist having 68 parts of 1½-in. steel hoisting ropes; and crane equipped with ten motors, having a total of about 1500 hp.

Crawford Door Company uses J&L superior quality, oil-tempered spring wire in 18 sizes for torsion and extension springs. Springs range from a few feet long to giants over 12 feet long, capable of raising 3,500-pound industrial doors without effort.

"UNIFORM HEAT TREATING AND TEMPERING PAYS OFF IN SUPERIOR J&L SPRING WIRE"

...says Crawford Door Co. official

"J&L has a superior spring wire because of the control they are able to maintain in their heat treating and tempering operations," reports Mr. Jerome Fansler, vice-president of the Crawford Door Company, Detroit, Michigan.

"J&L spring wire is properly tempered. This means the wire will coil uniformly. There are no surface imperfections or potential breaking points."

Crawford Door uses J&L oil-tempered medium basic spring wire for torsion and extension springs. They buy 18 sizes, ranging from .192 ($^{13}/_{64}$") to .293 ($^{19}/_{64}$").

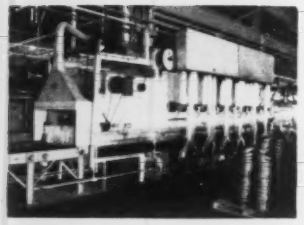
Every coil of J&L spring wire is thoroughly tested for uniformity of physical and dimensional properties. This uniformity can speed your production, reduce the number of rejects. J&L has complete control of wire quality from ore through finished product. When you specify J&L, you are sure of wire that is tops in quality yet competitive in price.

Next time you buy wire, call in your J&L representative for fast, satisfying service. Or write direct to Jones & Laughlin Steel Corporation, 3 Gateway Center, Pittsburgh 30, Pennsylvania.

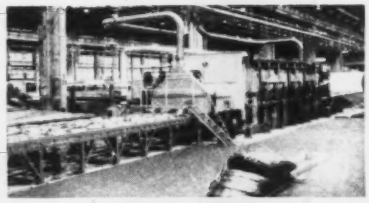
J&L STEEL

Jones & Laughlin Steel Corporation

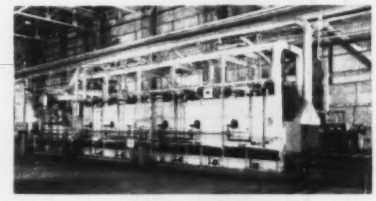
PITTSBURGH, PENNSYLVANIA



Another EF multi-purpose gas fired radiant tube, forced circulation roller hearth furnace used for bright finish annealing coils or straight lengths of copper tubing; also coils of thin gauge copper strip.



EF direct gas fired forced circulation roller hearth furnace for process and finish annealing copper and copper alloy tubing and rod in coils and straight lengths — also handles coils of wire.



This EF twin-chamber multi-purpose direct gas fired roller hearth forced circulation furnace uniformly anneals coils of copper or brass strip—operates either intermittently or continuously.

THE ELECTRIC FURNACE CO. Salem Ohio — Gas Fired Oil Fired Electric Furnaces

congratulates

AMERICAN BRASS

on opening new plant in

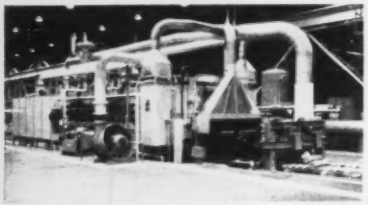
LOS ANGELES

The new plant of The American Brass Co. at Los Angeles—the West Coast's newest and largest brass mill—incorporates only the most modern methods and plant equipment for producing copper and brass strip, tubing, rod and other forms of brass, copper and copper alloy mill products.

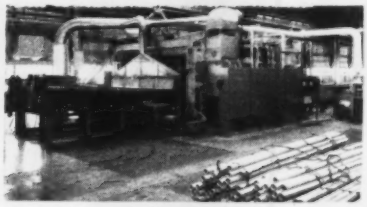
This progressive step in the Company's extensive and continuous modernization program, and the strategic location of this new plant, makes possible the economical production of large quantities of copper and brass products of the highest quality, standards of precision, and uniformity, and provides the means for rendering even better service to their customers in that area.

Long experience and the high standards of EF design contributed to the selection of The Electric Furnace Co. as the designers and builders of the furnaces required for this modern plant.

Submit your production furnace problems to experienced EF engineers—it pays.



An EF direct gas fired, 2 row, chain strand conveyor furnace for heating copper alloy billets for extrusion.



This EF direct gas fired, 2 row, screw conveyor furnace heats copper and copper alloy billets for piercing.

EF

BULLETIN No. 461

shows typical installations of EF Gas-fired, Oil-fired and Electric Furnaces.

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NEW PLANTS

Whitnon Mfg. Co., Farmington, Conn., opened a plant at 20466 Wyoming Ave., Detroit 21, Mich., which specializes in the repair and reconditioning of antifriction spindles. The firm makes spindles for boring, grinding, milling, and drilling.

HEF Inc., Philadelphia, is constructing a plant to produce ammonium perchlorate, an oxidizer used in solid propellents for rockets and missiles. Lithium perchlorate also can be produced. The facility is adjacent to the Columbus, Miss., plant of Hooker Chemical Corp., Niagara Falls, N. Y. one of the parent firms. The other owner is Foote Mineral Co., Philadelphia.

Alloy Steels Inc., Detroit, is establishing a branch warehouse at 2531 Needmore Rd., Dayton, Ohio. Operations will start about Aug. 15.

Rio Tinto-Dow Ltd., a recently formed subsidiary of Rio Tinto Mining Co. of Canada, Toronto, Ont., and **Dow Chemical of Canada Ltd.**, Sarnia, Ont., will build a chemical plant north of Elliot Lake, Ont.

Pesco Products Div., Borg-Warner Corp., Bedford, Ohio, moved all activities of its Automatic Warehousing Branch to Wooster, Ohio. The branch is engaged in the design, development, fabrication, and installation of reserve storage warehouse systems featuring semiautomatic or automatic operation and of custom material handling equipment. The branch also produces conveyorized production line systems and tooling for service and overhaul of jet engines.

K S M Products Inc., Merchantville, N. J., established a manufacturing plant and sales office at 379 Bering Ave., Toronto, Ont. The firm makes studwelding equipment, accessories, and welding studs. William Pennycook is sales manager for Canada.

Skyvalve Inc., Syracuse, N. Y., established manufacturing and office facilities at 2308 Washington Blvd., Venice, Calif. The firm is

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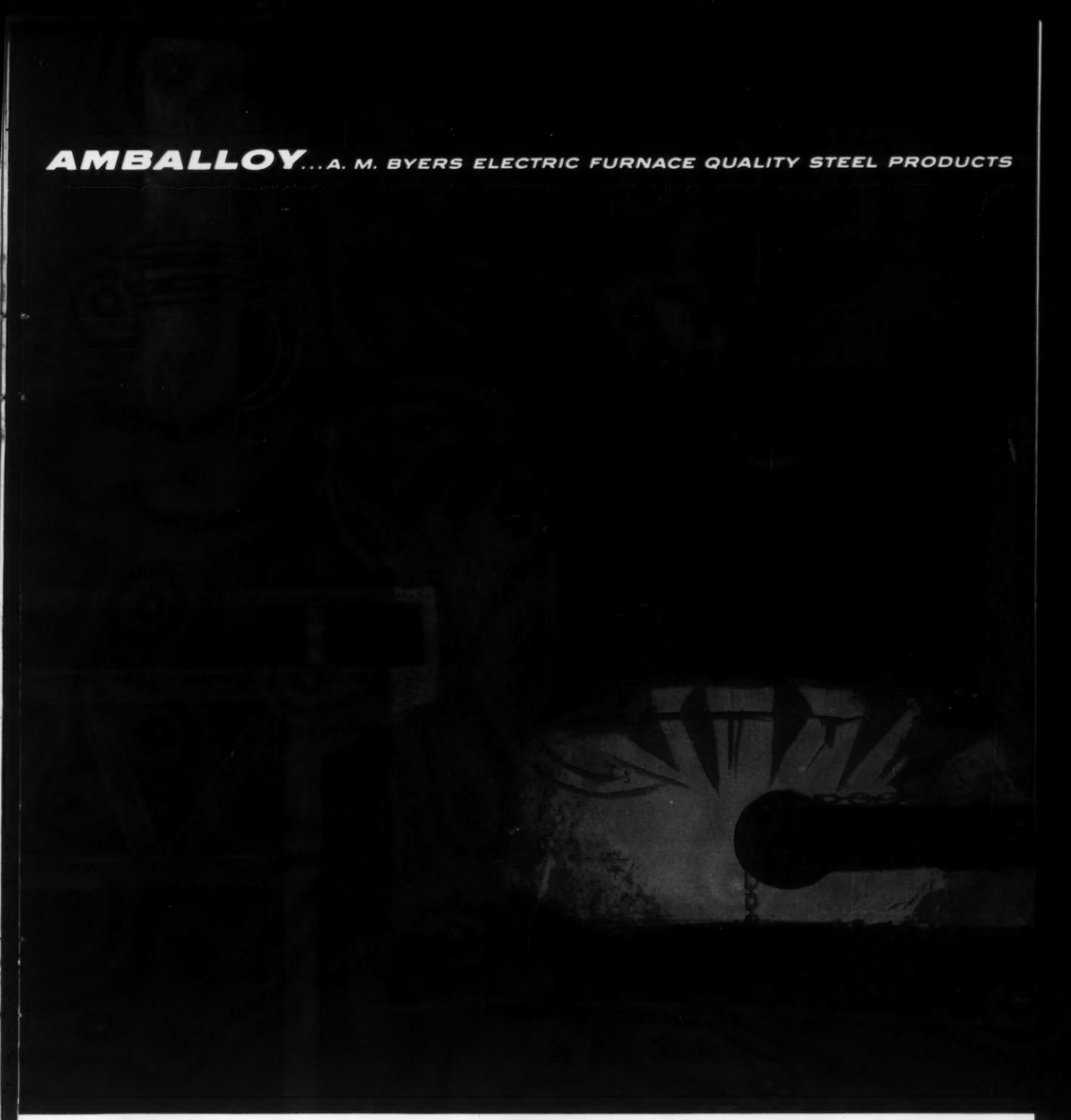

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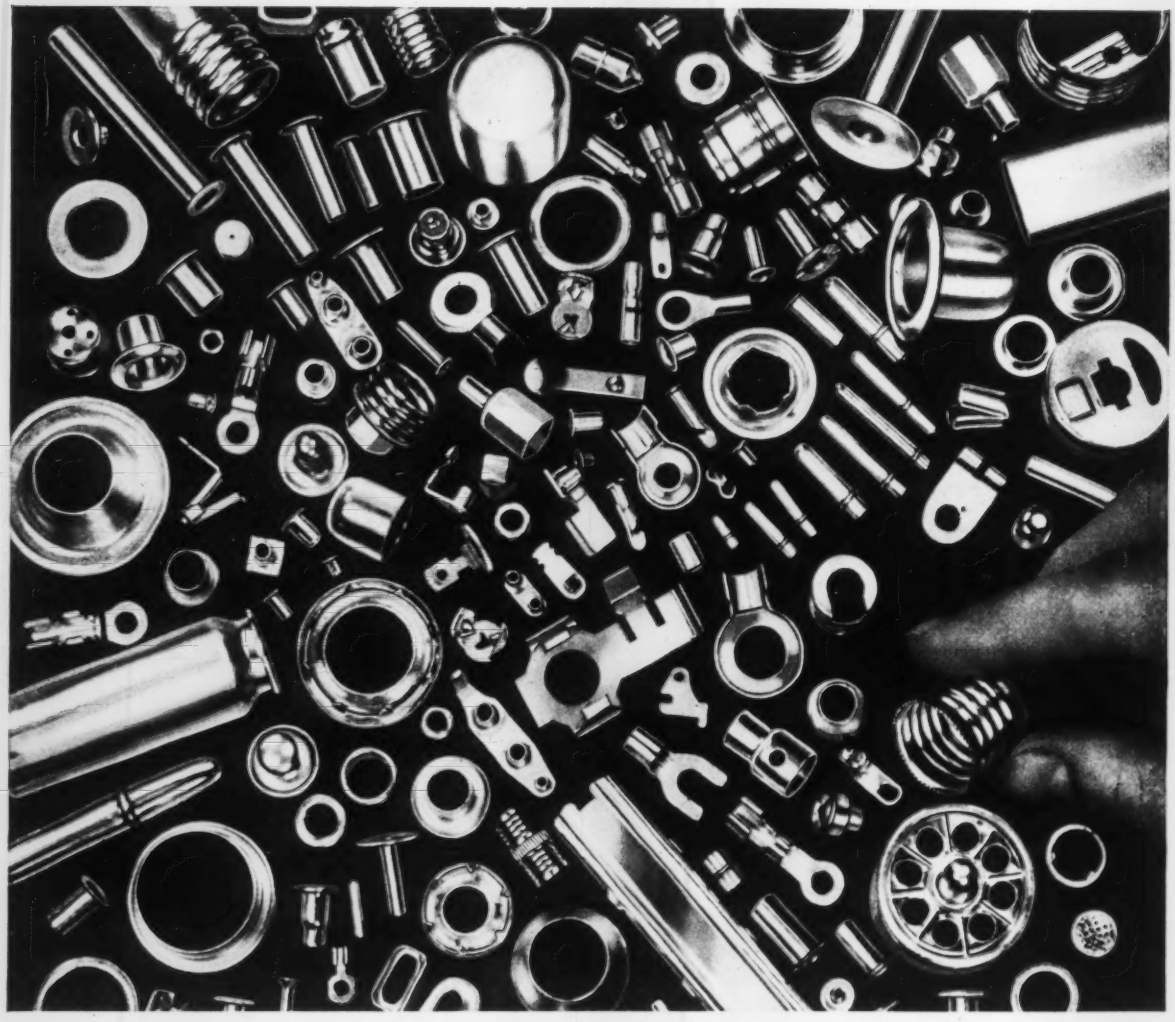
Ninety-three years of producing ferrous metals have familiarized us with many of your problems. So check Byers first for your steel requirements. Write for new catalog. A. M. Byers Company, Clark Building, Pittsburgh 22, Pennsylvania.

A growth company with the emphasis on quality and service **A. M. BYERS COMPANY**



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These are only a few of the thousands of multiple-plunger and progressive-tool press products we supply to every branch of industry—from simple eyelets to precision electronic components.

We offer a complete design-engineering service based on long experience and specialized production equipment, and are often able to suggest ways and means of using our stock tools to further cut costs.

Simply send us a sample, drawing or description of the parts you need, plus the quantity. The metal can be copper, brass, bronze, nickel silver, nickel, iron, steel, stainless steel or aluminum . . . and in any applied or plated finish you choose.

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a subsidiary of Engelberg Inc. and specializes in the development and manufacture of high-pressure pneumatic and hydraulic valves for aircraft, missiles, and rockets. R. L. Schaller, vice president and general manager, will supervise operations at Venice.

CONSOLIDATIONS

Idaho Maryland Mines Corp., San Francisco, acquired Sierra Tool & Mfg. Co., Glendale, Calif., producer of components and assemblies for aircraft and guided missiles.

Yuba Consolidated Industries Inc., Benicia, Calif., is acquiring Judson Pacific-Murphy Corp., Emeryville, Calif., steel fabricator. Judson Steel Corp., owner of a portion of the stock of Judson Pacific-Murphy, is divesting itself of that holding and will continue to produce reinforcing bars.

Farrell Mfg. Co., Joliet, Ill., purchased **Indiana Oil Equipment Co.**, Indianapolis. Farrell is a leading truck tank manufacturer; Indiana Oil Equipment, a large oil equipment jobber.

Thompson Products Inc., and its affiliate, **Ramo-Wooldridge Corp.**, will merge, subject to approval of stockholders. The resulting company will be named Thompson Ramo Wooldridge Corp. Officers will include: Board chairman and chief executive officer, J. D. Wright; president, Dr. D. E. Wooldridge; executive vice president, Dr. Simon Ramo; and head of the executive committee and special consultant, F. C. Crawford.

Koehring Co., Milwaukee, producer of heavy construction equipment, purchased **Ka-Mo Tools Inc.**, Cicero, Ill., maker of earth drilling and boring equipment. The Ka-Mo Tools business is a department of Kwik-Mix Co., a division of Koehring Co., under E. W. Maas.

Ling Electronics Inc., Culver City, Calif., acquired **United Electronics Co.**, Newark, N. J. United specializes in producing high energy, thermionic tubes and ceramic vacuum capacitors.

Why Gamble on Blast Cleaning Efficiency?

...when your profit is at stake!

The chances are 3 to 1 that your blast cleaning operation costs you far more than it should. Check this list and see how many ways you can save.

CHECK LIST OF BLAST CLEANING EFFICIENCY

	Yes	No	Don't Know
IS YOUR BLAST EQUIPMENT ADJUSTED TO GIVE YOU MAXIMUM PRODUCTION BY:			
1. Throwing the maximum amount of abrasive at the work?			
2. Throwing an abrasive mixture with a full range of sizes, and no contaminants?			
3. Throwing all the abrasive upon the work with minimum wear on machine parts?			
4. Using the abrasive best suited for your application?			
ARE YOU GETTING MAXIMUM CLEANING ECONOMY BY ELIMINATING ABRASIVE LOSSES:			
1. Through the separator system?			
2. Through the dust collector and ventilation system?			
3. Through abrasive carried out with the work?			
4. Through cabinet leaks and poor housekeeping?			
ARE YOU REDUCING MAINTENANCE COSTS AND PRODUCTION LOSSES BY:			
1. Obtaining longest possible life from wear parts?			
2. Using preventive maintenance to reduce "down time"?			

If you have to answer "no" or "don't know" to any of these questions, you're gambling with potential profit dollars. The best way to eliminate this gamble and save any profit "waste" is described in Wheelabrator Abrasive Bulletin No. 902D. Write for your copy today.

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For steelcutting . . . trim costs with Carboloy® Extra-Performance Grades 330, 350, and 370, and low-cost, General-Purpose Carboloy 78 and 78B carbides

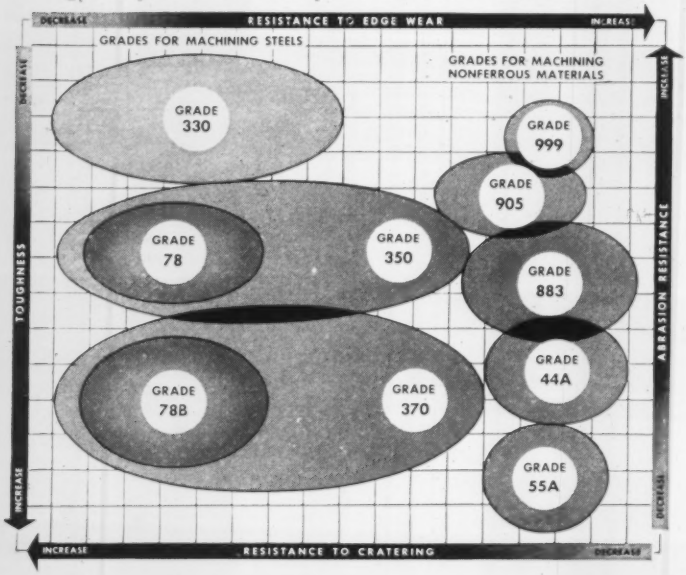
Some steelcutting jobs call for extra-tough, extra-performance carbides. Others can only be handled profitably with low-cost, general-purpose carbides. That's why we make them *both*.

Where you need increased machine productivity and have long production runs to keep cost-per-piece low—use Carboloy Extra-Performance Series 300 carbides. Their added strength and stamina handle jobs ranging from heavy roughing to high-speed finishing . . . at a unit cost and rate no "premium" carbide on the market can beat.

But, for general-purpose steelcutting jobs that don't require the Extra-Performance carbides, use Carboloy Grades 78 and 78B. Their top-notch performance, at low initial tool cost, will keep your machines operating profitably.

Chances are, your plant should be using *both* grades. Your local Authorized Distributor of Carboloy cemented carbides can deliver tools, blanks and inserts you need . . . in a hurry.

This complete team of Carboloy cemented carbides gives you more for your carbide tool dollar!



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For nonferrous materials . . . boost production rates with Carboloy® cemented carbides performance-matched to your machining jobs

Aluminum, titanium, super alloys, wood—all have machining peculiarities that raise cain with production schedules and tool costs. That's why we make *five* job-tailored Carboloy cemented carbides for cutting these materials.

With these five grades (see chart, at left), you can get the one with exactly the right combination of shock resistance and wear resistance to match your job—whether heavy, interrupted cuts, or precision finishing.

Because you're using performance-matched carbides with consistent metallurgical quality, you can schedule heavier production loads . . . and you will get this increased output at lower tool-cost-per-piece.

Your local Authorized Carboloy Distributor has complete stocks of tools, blanks, and inserts in these five grades. A phone call to him today will get your machines humming faster tomorrow.

For more information on Carboloy Extra-Performance and General-Purpose carbides, or nonferrous material carbides, write: Metallurgical Products Department of General Electric Company, 11141 E. 8 Mile Road, Detroit 32, Michigan.

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CEMENTED CARBIDES

GENERAL ELECTRIC

N.A.C.A. Ames Aeronautical Laboratory at Moffett Field, California, uses this milling machine capable of producing a complex curvature such as airfoil model in one milling operation. The machine weighs 150 tons, and was designed and built by Danly Machine Specialties, Inc.

Completely powered by a Reliance V★S, this new machine can sculpture in metal a complex airfoil shape at a fraction of the time and cost required to produce a similar shape by conventional machine tool and handwork methods.

Working at tolerances of better than plus or minus 0.004 in., the Reliance V★S Drive must provide variable speeds between the milling cutters which shape the blank and the pattern table where the pattern is mounted.

A Reliance V★S Drive was specified by Danly to power this new mill because of its ability to perform accurately, even under adverse conditions.

Write or call for further details.

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STEEL

July 21, 1958

Technical Outlook

NEW CELLULAR REFRACTORY— Pittsburgh Corning Corp. has introduced an insulating and refractory material made from 99 per cent pure silica that can be used in blast furnaces and heat treating furnaces where temperatures don't exceed 2200° F. Its lightness (10 to 12 lb per cu ft) also makes it a valuable stack lining material. Called Foamsil, the product resists most acids, is fireproof and waterproof, and is easy to cut.

PORCELAIN-TO-ALUMINUM SEAL— Ceramic material engineers at Westinghouse have a method for sealing aluminum to electrical porcelain that requires no intermediate material and no vacuum or atmosphere heat treatment. The seal is mechanically reliable and vacuumtight. It is made by bringing the porcelain (while at high temperature) in contact with molten aluminum. A chemical bond is formed between the two materials, says Westinghouse.

SHAKE, RATTLE AND ROLL—Package Research Laboratory, Rockaway, N. J., has set up jiggle and jolt apparatus which will test the shipability of any package up to 10 tons total weight. Included is a vibrating machine, a drop test and stacking test pit, and an inclined impact tester.

GAMMA RAYS CHECK FURNACE LEVEL— Nuclear Corp. of America, New York, has developed an electronic device utilizing nuclear energy to determine the level of molten metal in a foundry furnace. Called Indicon I-100, the unit projects gamma rays through the furnace to two Geiger counters, mounted at maximum and minimum fill levels. The signal can be harnessed to actuate automatic furnace controls.

TRACER READS PENCIL LINE— A new development by Westinghouse Electric Corp. promises to eliminate tedious manual tracing in multiple gas torch cutting operations. Called Linatrol, it's a device that utilizes a vibrating photosensitive cell to accurately follow a pencilled drawing or pattern. Compared with elaborate automatic tracing mechanisms, the use of Linatrol reduces pattern preparation costs, cuts initial equipment costs, and increases speed and accuracy, says Westinghouse.

MORE DIE LIFE— You can make solid forging dies of Haynes Stellite with an electrical discharge method, says Elox Corp. of Michigan, Royal Oak, Mich. You line the cavity completely with Stellite, and finish it with zinc-tin electrodes shaped like the finished part. Such dies last five times longer than those made of die steel, says Elox.

ATOMIC TOOL TURNOVER— If you expect to machine nuclear materials, be prepared for nearly 75 per cent more designing. Super Tool Co., a division of Van Norman Industries, Detroit, says design life is as little as 90 days. It maintains a "production" line of designers to keep pace with research changes.

DRAWING FOR REDUCTION—Companies that microfilm their engineering drawings for filing or distribution copies are finding that drawing techniques have to be revised to get the best results. Enlarged lettering, heavier lines, and simplification result in better microfilms. Bell Telephone Laboratories has set up standards for the purpose.

ULTRACLEAN WITH ULTRASOUND— Navy's new ultrahigh frequency cleaner handles complete jet engine assemblies (rotors, turbines, combustion chamber nozzles). The tank is 4 ft deep, 4 ft wide, and 6 ft long. The device cuts cleaning time for a jet engine from 12 hours to less than 1 hour.

JET AGE AUXILIARIES— Hobart Bros. Co., Troy, Ohio, is building outsize diesel-electric generating units on wheels to supply current for Boeing's new 707 jet airliners when they're on the ground. How big? The air conditioning alone requires 90,000 watts.

Metalworking Outlook—Page 65 Market Outlook—Page 145

OLD METHOD Hand Indexed Machine

Chassis components	Hours per unit
Layout and punch template	12.00
Panels	0.718
Chassis	1.485
Side brackets	0.100
Resistor board (on drill press)	0.345
Total hours	**14.648**

NEW METHOD Duplicating Machine

Chassis components	Hours per unit
Layout and punch template	6.00
Panels	0.104
Chassis	0.289
Side brackets	0.010
Resistor board	0.050
Total hours	**6.453**

How We Beat the Cost Crisis

Our Duplicator Paid for Itself in Less than a Year

Manhour savings in electronic chassis production recoup a $10,000 investment. It's another example of how aggressive cost cutting can help you trim unnecessary expense with more efficient production. This article is one of the top entries in the Cost Crisis Awards Competition. Look for another one next week

THE JOB: Produce complex electronic equipment for the nuclear energy industry. A production run of ten identical parts is a long one.

Vernon Brown, plant manager, Radiation Counter Laboratories Inc., Skokie, Ill., says that as part of an over-all cost control program he pinpointed the charges for making electronic chassis, and figured they were excessive.

"We were spending up to 12 hours to make a template. Production time to make an individual chassis ran more than 2½ manhours."

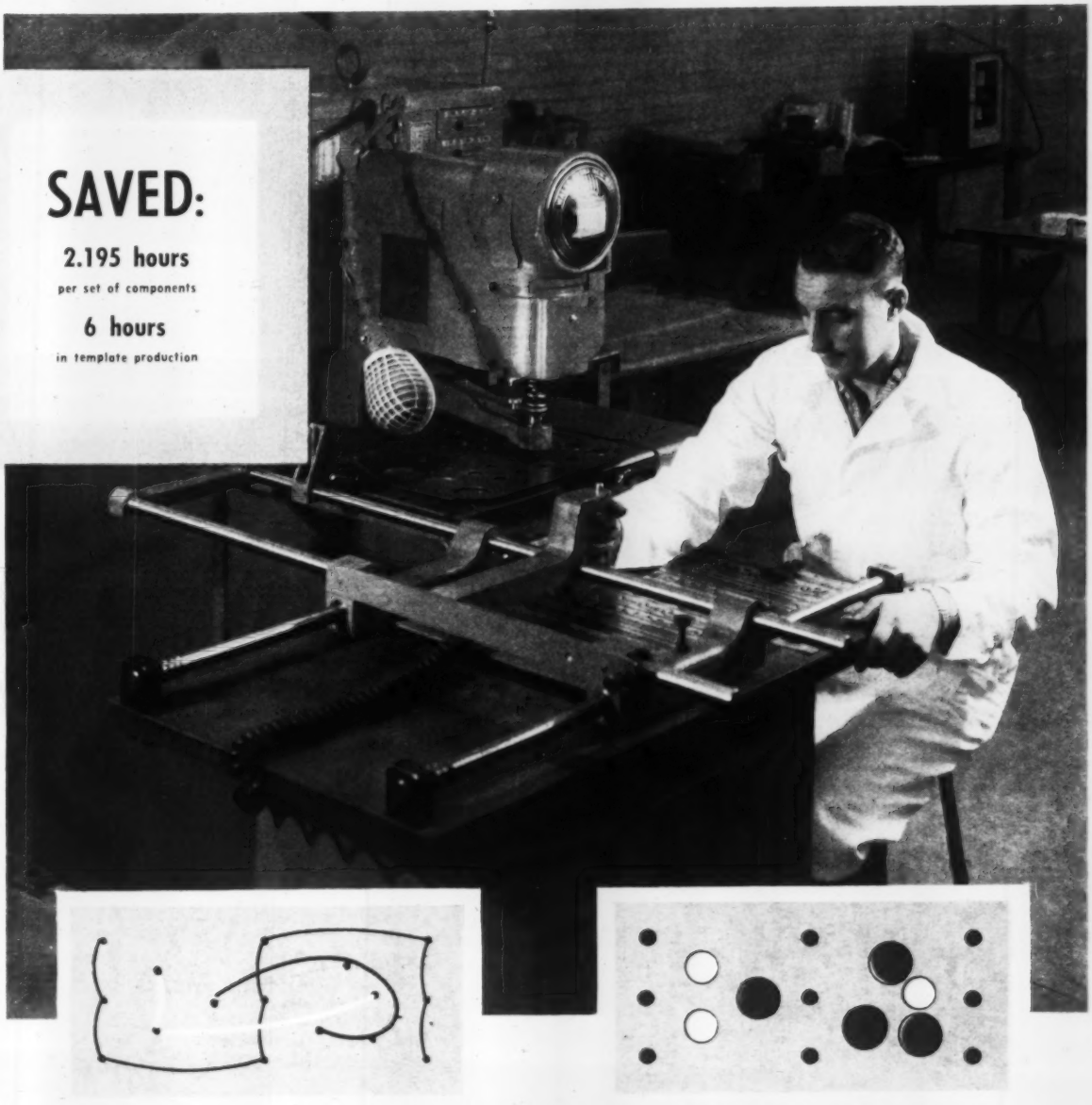
The Steps—Starting with a blueprint, the templatemaker had to layout a drawing of the part on metal, establishing cross lines for hole centers and scribing each circle diameter.

Once the template was drawn on the blued metal, an operator punched out each hole to size. Where the drawing called for slots, sawing and filing were necessary.

The completed template was clamped to a part blank. Then, on the rotary punching machine, the operator indexed the proper punch and die by hand over the hole to be punched.

Time was lost not only in hand indexing, but in slowly lowering the punch into the template hole to get proper alignment. Templates were gradually nibbled away on the hole edges, and tolerances often varied by as much as 1/32 in. This led to considerable rework during assembly.

Now—Starting with the blueprint, the template layoutman marks hole center lines only, and



Operator traces hole pattern in template with stylus to position the punch. Color code on template (left inset) shows him where to move stylus next. Black holes in part (right inset) are 1/2 in., white holes are 3/4 in., blue holes are 1 in.

then indicates the hole size. With the new Wales-Strippit fabricator-duplicator, he punches a 3/16-in. hole at each cross line.

Next, each hole on the template is color coded for size—one color for holes that will be 1/2 in. in the chassis, a second color for 3/4 in., etc. The holes are connected by painted lines of the same color.

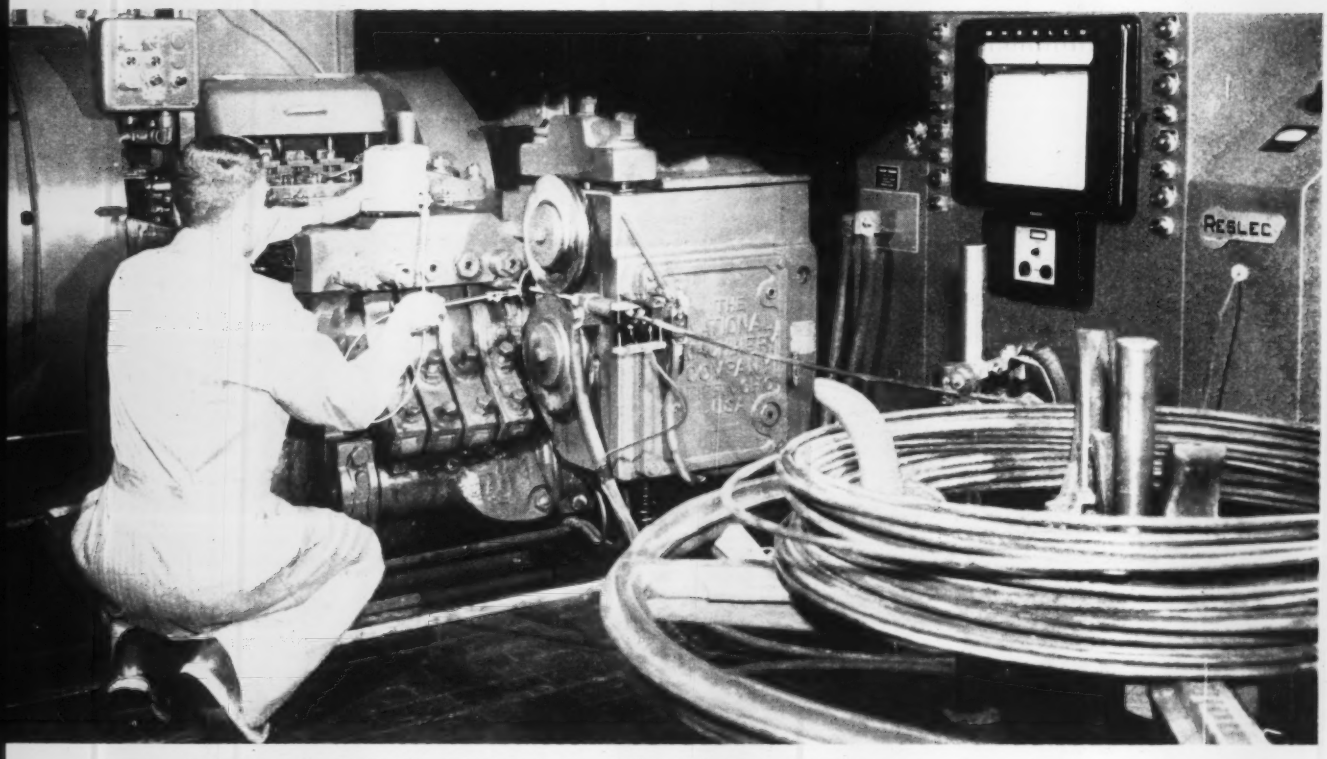
The operator clamps the template to the copying table. He inserts the size die and punch he wants in the machine, and follows the color line with the copy stylus from hole to hole, punching that specific size.

He puts the next size die and punch in the machine and follows a second color route around the template with the stylus.

Profit — Selling management on the program, Mr. Brown says he worked up preliminary cost figures to determine the volume of similar units needed as well as total production volume to make investment in new equipment economical.

"We made a conservative estimate that savings would pay for the cost of the equipment (about $10,000) in about a year and a half. Further refinements and experience permitted us to realize the savings in less than a year."

In addition, rework was cut because tolerances are held closer. Templates formerly lasted about three months—now they'll last indefinitely.



A research engineer at the National Machinery Co., Tiffin, Ohio, uses a pyrometer to obtain temperature data on heated wire. This is an experimental application of warm heading to a standard 5/16-in. cold forming machine. At the right is a recording type controller, made by Herscott Co., Rockford, Ill., that governs the temperature of the resistance-heated wire

Warm Heading Tackles Tough Metals

Increasing emphasis on high strength, high temperature materials focuses industry attention on this special purpose technique. Here's report on progress to date

WARM HEADING may help solve some of your toughest forming problems. Already in production in a few plants, it is on trial in many more.

The process has an impressive potential; it also has a fair list of problems and an apparently well-defined area of special payoff.

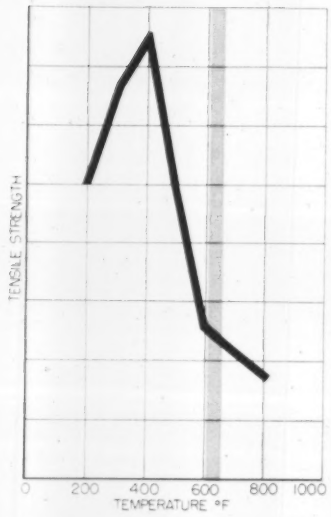
Where It Works—The process (it's like cold heading, but the stock is heated in the range from 200 to about 1000° F) is specialized for tough metals. When you need to upset high-strength and high-temperature alloys, including some stainless steels and titanium, warm heading may be the best practical answer. Many of these metals work harden severely. At elevated temperatures, work hardening is greatly reduced. This may eliminate the need for annealing after forging.

Other tough metals, like 52100 steel, have high tensile or yield strengths (difficult to move). Proper heating lets you move the metal with less force; it will fill die cavities better. Part finish may improve, and internal stresses will be reduced.

Unlike hot heading, warm heading works below the critical temperature—does not alter the metal's properties.

Die Life—With less work hardening, and with lower forces needed to move the metal, die life can be

Why It Works



This curve is a typical plot of temperature against tensile strength. It shows that the addition of a small quantity of heat increases the strength, and forming would be even more difficult than if it were done cold. Additional heat, however, cuts the strength and would aid forming.

In this case, the optimum temperature range for warm heading is about 550 to 600° F. Below that, there is no significant gain over cold heading. Above 600° F, heat increases bring relatively small gains in formability.

Source: Tocco Div., Ohio Crankshaft Co.

What Temperature Do You Use?

Probably the most critical variable in the warm heading process is the temperature at which the stock is worked. Desirable, or optimum, temperatures for the different metals and part sizes have been arrived at through trial and error, and the data, usually considered proprietary, are closely guarded.

Some of this information is tabulated below. Dr. Harry B. Osborn Jr., Tocco Div., Ohio Crankshaft Co., Cleveland, explains that variance in temperature is caused by the varying stock sizes and different kinds of forming equipment. In specific applications, these temperatures should be used only as starting points.

AISI	Diameter (inches)	Temperature—° F
C 1118	⅝ to 1½	550
C 1137	⅝	700
C 1144	1 to 1¼	825
4140	¾	800
8620	⅝	725
8620	¾	750
5150	1	800
6150	¾	825
8640	⅝	800
8640	½	750
1040	¾	700
304 SS	0.280	850
304 SS	0.340	825
430 SS	5/16	450
420 SS	½	650

extended. E. A. Channer, vice president, H. M. Harper Co., Morton Grove, Ill., says his company found this true, particularly when warm heading materials with high chrome content. Harper has tried it on a variety of metals, including Discaloy, Refractaloy, A286, and titanium. Warm heading at Harper is done on conventional cold forming machines; the stock is induction heated.

O. L. Ducharme, factory manager, Ferry Cap & Set Screw Co., Cleveland, says that his company, though not in production on warm heading, has tried it on a variety of metals including 1010, 1020, 1038, and 8637.

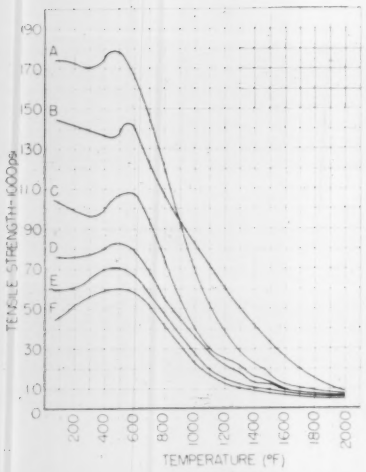
Fallacies — Warm heading has been credited with some advantages that seem destined to fall apart as more is learned.

Sample: Warm heading is an over-all improvement on cold heading. (Although it's true that every metal moves easier warm than cold, the added complexity of the setup and cost of the operation will make it a nonessential luxury on materials that are relatively simple to form cold.)

Here's another: Since the metal flows more easily, it will be possible to make bigger upsets in conventional metals on small machines. (Men who have worked with the process claim that if the metal can be cold headed easily, in the long run it is simplest and cheapest to do it that way.)

Some observers speculate that since the material flows more easily and lower forces are required, you can save money by going to cheaper die materials. That, too, is wrong. Higher working temperatures themselves act as a brake on die life. Also, technicians at National Machinery Co., Tiffin, Ohio, (where they have spent more than $1 million on warm heading basic research) say they have some problems holding the lubricant (copper or lime coating on the stock) in place, particularly at temperatures over 800° F. They have gone to carbide dies for most of their warm heading experiments. Dies at H. M. Harper also have carbide inserts.

What Temperature?—If you use the wrong amount of heat, the result can be disastrous. Since strengths of some materials rise with heats to about 400° F, temperatures must be chosen with utmost care.



These curves, plotted at National Machinery Co., show how temperature affects tensile strengths of several steels. Steel A is 0.40 C, 3.00 Ni, 1.00 Cr; B is 0.40 C, 1.00 Cr, 0.02 V; C is 0.40 C, 3.50 Ni; D is 0.40 C open-hearth steel; E is 0.20 C open-hearth steel; F is wrought iron. Optimum range for warm heading here would be somewhere between 800 and 1000° F

and controlled accurately. National Machinery's program has tried six different heating types: Vacuum tube induction heating in the 450,000 cycles per second range, motor generator induction in the 10,000 cycles range, gas, radiation heating with Calrod units, high-speed induction (ac and dc), and low-speed induction (ac and dc).

Harry Lange, manager, Cold Heading Machinery Div., Waterbury Farrel Foundry & Machine Co., Waterbury, Conn., says ±20° F may make the difference.

Most companies determine the best temperature through trial and error, consider the information proprietary. The table (bottom of Page 115) will give you some starting points.

How Do You Know? — Dr. Harry B. Osborn Jr., Tocco Div., Ohio Crankshaft Co., Cleveland, recommends that temperature-tensile curves be plotted for the metals you intend to warm head. (He presented a paper on the subject at the American Society for Metals' Southwestern Metal Exposition & Congress in Dallas.)

He suggests: Use ¼-in. diameter test bars; induction heat the center portion of the bar in a conventional tensile testing machine, bring the bar to the test heat, reduce power to hold the heat, test as slowly as possible and maintain the temperature within ±25° F.

A plot of five tests at well chosen temperatures on a metal should be enough to let you project a curve like those shown. The curve will tell you, probably within 50 to 100° F, the optimum temperature for warm heading. Pick the range at the lower end of the steep slope (shaded area on curve at top of Page 115).

False Alarm — First reports on warm heading pictured it as a panacea for most forming problems. National Machinery's experts say it's not. Their work, started in 1923 with the electric header, has proved that most jobs traditionally done cold will continue to be done cold.

One eastern manufacturer says: "After experimenting with warm forging, we feel now that it is not what it was first expected to be."

Others have cooled off on the process, except as a problem solver for the tough alloys and metals. Harper's Mr. Channer says: "The importance of warm heading will vary inversely with the ductility of the workpiece material."

As the aircraft, gas turbine, and other industries reach for higher properties in their materials, warm heading will have an increasingly stronger role to play in the forging business. The more than a dozen companies working with it, in production or in research, have proved it's here to stay.

Grease Cuts Waste

Heavier viscosity lubrication on large gears costs less and improves housekeeping, safety

YOU can eliminate throw-off waste from open gears by using a high tenacity grease.

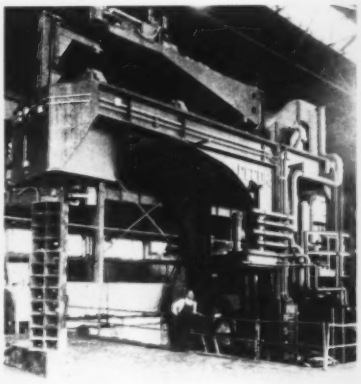
A rolling mill had trouble with a 10-ft bull gear in its breakdown mill. Aside from wasting grease, it spattered the work area and increased the fire hazard. Costs were excessive: The gear had to be lubricated once a week.

Solution—The plant superintendent solved the problem with a light open gear grease (Keystone Lubricating Co., Philadelphia). Throw-off is eliminated, and maintenance men lubricate only once every six weeks.

After a run of three weeks, the gears are still covered with an excellent protective film. Only a few specks are on the guard. The grease doesn't thin enough to permit capillary attraction to pull it onto the pinion overhang.

Purpose — The Keystone grease was developed for open gears in strenuous service. High speeds, pressure, or heat won't thin it out. It is a highly adhesive lubricating film that reduces wear, dampens noise, increases gear life, and lowers power consumption. It resists acids and alkalies, and provides effective lubrication from 40° to 400° F.

Crane To Serve Converter

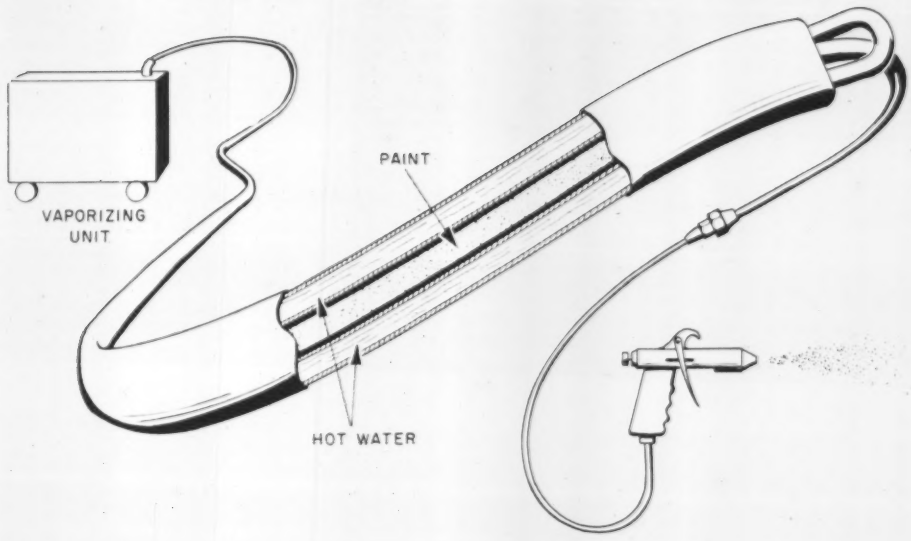


Destined for McLouth

Engineering of oxygen converter shops hasn't settled down to any pattern. The photograph above is evidence of that. It shows a turning crane designed to carry the hood and lance hoist mechanism for an 80-ton capacity oxygen steel converter being installed at McLouth Steel Corp., Trenton, Mich.

Reminiscent of the electrode mast and roof swinging mechanism on an electric furnace, the crane will swing the dust hood and lance out of the way when the vessel is charged or poured. All utilities, such as electric wiring, and piping for oxygen, cooling water, and compressed air, are mounted on the crane.

Pennsylvania Engineering Corp., New Castle, Pa., made the crane. It also built the 35-ton oxygen converters operating at McLouth.



Hot Lines Keep Paint Fluid

Heat permits use of long lines for airless painting. Booths are not needed since solvent content is low; paint dries in midair if it doesn't readily find a surface

CLOGGED hoses have plagued users of airless paint units, forcing them to work with short lines that curtail mobility. The problem has been solved at Douglas Aircraft Co., El Segundo, Calif.

Finishing lines have three channels — two circulate hot water around the third, keeping paint warm and fluid. Pump wear is reduced by using a design with a piston that displaces into a cavity instead of rubbing against cylinder walls.

Paint is pumped into a pair of heat exchangers. Heat and pressure cause the paint to vaporize before entering the lines. It is atomized merely by using a spray gun to release the pressure. The need for solvents is reduced and defects like orange peel are prevented.

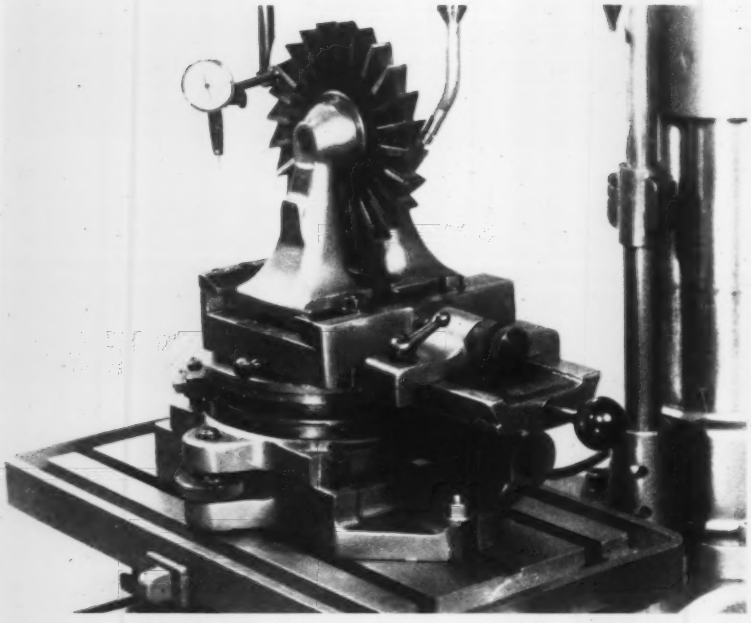
Other Advantages—Using the redesigned unit, finishing is two to four times faster than it is with standard spray equipment. It is possible to use longer hoses (up to 150 ft) which reduce setup time for painting large parts (such as major airframe assemblies) and buildings. Hard-to-reach areas are painted without using scaffolds. In some relatively inaccessible areas, operators have painted surfaces 10 ft away from the spray nozzles.

The low solvent content permits buildup of a relatively thick coating in one pass and eliminates the fire hazard of working away from booths.

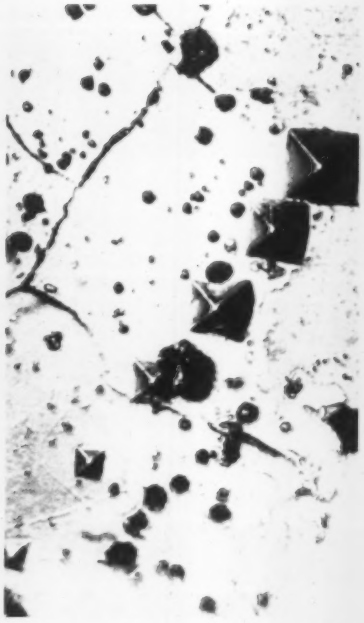
Virtually no backspray is produced since the atomized coating particles are not carried on expanding air. Reduced quantities of overspray and solvents mean less irritation for the operator's skin and eyes, making working conditions cleaner and more healthful.

No Overspray Problem—All types of organic finishes can be applied with the unit, but Douglas is using it mainly where flat mill white is required. Fast drying materials are used. If paint particles don't hit a surface, they dry and lose their tackiness in midair. They are like dust when they come in contact with a solid surface, simplifying the task of cleaning areas where overspray falls.

The unit must be preheated for about 20 minutes before the 150-ft hose will be warm enough to maintain satisfactory coating temperatures. Shorter hoses require less preheating. Pumping solvent through the lines cleans the equipment in about 10 minutes.



A milling cutter is mounted in the Sparcard. Its cutting edges will be given a hard carbide coating



The increased hardness is illustrated by diamond indentations of hardness tests

Coating Upgrades Low Cost Tools

Tungsten carbide is deposited by a process that is the opposite of spark erosion. Surfaces have satin finish. Shallow craters are lined with the hard electrode metal

SPARK DEPOSITION is being used to put tungsten carbide on the surfaces of low cost, high speed cutting tools. The process was developed by Impregnated Diamond Products Ltd., Gloucester, England. Its machine (Sparcard) is distributed in the U. S. by Easco Products Div., Electro Arc Sales Co., Ypsilanti, Mich.

Used at Point of Wear — The coating is applied to the tool surface that is subject to the greatest wear—generally the top rake. The fine layer of material transferred from the electrode is harder than the tool material.

The treated surface resembles that produced by spark machining. It has shallow cratering and a satin finish. The craters are lined with hard electrode metal. Hardening penetrates the subsurface of the treated metal. Photomicrographs show that a sandwich effect is produced: The surface and immediate subsurface are hardened. A soft zone is between them and the parent metal.

The main differences between this process and spark erosion are in the circuitry and the replacement of the servofeed with a vibrator, which holds the electrode.

Coating a Part—Before treatment, a tool must be ground and free from oil, grease, and dirt. It is placed in the holder and brought close to the electrode. A micrometer setting controls the vibrator head and can adjust for irregularities in the tool surface.

When the vibrator and current are turned on, the spark discharge (derived from a direct current source) spans the air gap between the electrode and the work. It is controlled by condenser banks that are designed to yield four types of surface finish as the electrode traverses the surface of the tool.

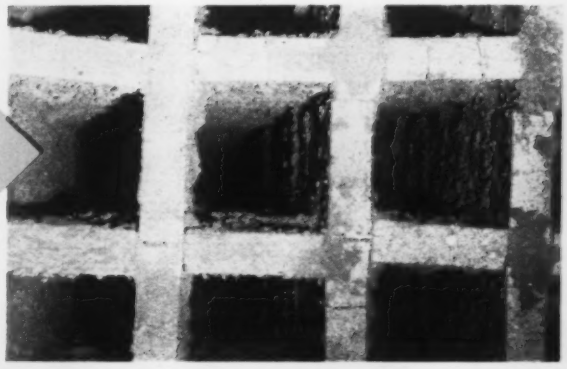
A compound table supports the work. It has longitudinal movement of 12 in. and transverse motion of 6½ in. A universal toolholder adapts to single point tools, reamers, and milling cutters up to 8 in. in diameter.

HARBISON-WALKER

FORSTERITE L CHECKERS

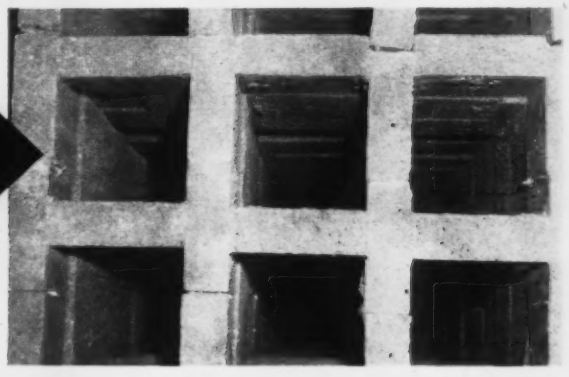
LIKE NEW AFTER 1105 HEATS!

AFTER THE FIRST TWO CAMPAIGNS—378 HEATS the Forsterite L Open Hearth checkers looked like this—



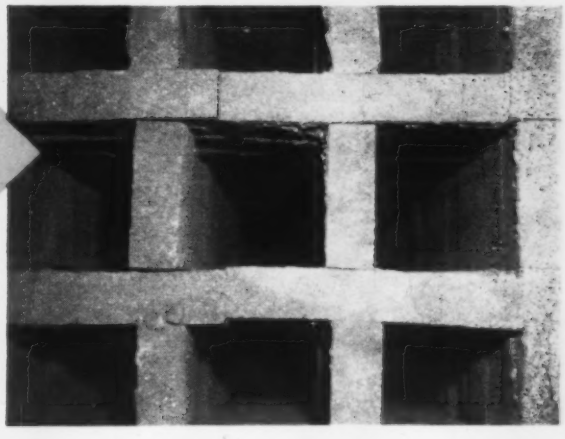
The friable character of the slight dust build-up is evident in this photograph.

CLEANED AND READY TO GO BACK INTO SERVICE they looked like this—



Cleaning is quickly and easily accomplished because Forsterite L Checkers resist slagging, spalling and clogging.

AFTER 1105 HEATS—cleaned and ready for more service—they still look like new!



The amazing durability of this magnesium-silicate refractory brick is clearly shown by the pictures. Furthermore, the mineral forsterite has inherent properties which give the checkers exceptionally high heat capacity. The results are longer life, easier and less frequent cleaning, and greater thermal efficiency of the checker settings.

World's Most Complete Refractories Service

HARBISON-WALKER REFRACTORIES CO.
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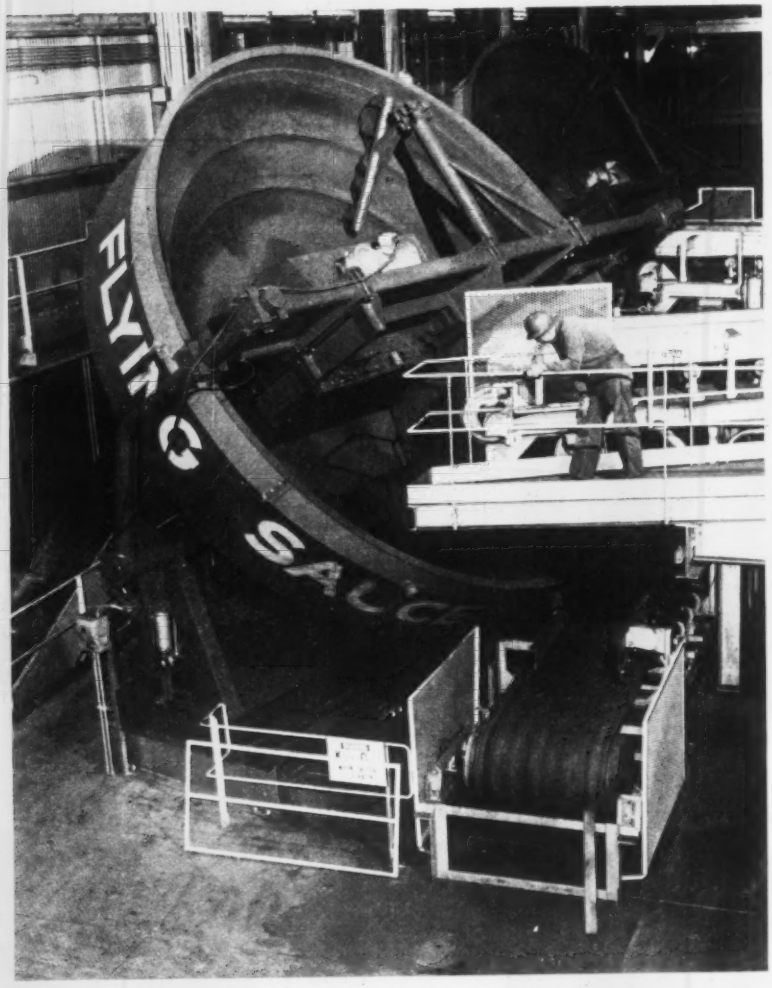
GENERAL OFFICES: PITTSBURGH 22, PENNA.



Emphasis is placed on material mixing in U. S. Steel's new sintering plant at Youngstown. For mixing and pelletizing, two Flying Saucers (18-ft rotating dishes) are used

Mix Is Key to Better Sinter

If you want high quality, give more attention to material preparation, says Dwight-Lloyd Div., McDowell Co. Inc., builder of Youngstown sintering plant for U. S. Steel

WITH blast furnace operators everywhere acknowledging the value of beneficiated burdens, the demand is strong for better burden components, especially sinter.

The Dwight-Lloyd Div. of McDowell Co. Inc., Cleveland, which engineered and built the new 5000-ton-a-day sintering plant at U. S. Steel Corp.'s Ohio Works, Youngstown, says, "Far and away the most significant refinement of today's continuous sintering is related to raw material preparation. This parallels beneficiation of material for blast furnace charging."

Personnel of the Dwight-Lloyd Research Laboratories in Cleveland declare that quality of sinter depends on quality of the mix.

Requirements — For consistently efficient sintering, fuel content, moisture, and bed permeability must be uniform, they say.

Many ingredients, having various physical properties, may make up the charge burden for a typical ferrous sintering plant. Those might be ores of varying sizes and moisture contents, dry blast furnace flue dust, sinter machine exhaust dust, dry granular returns—cellular in texture and varying in temperature, sticky iron-bearing sludges, and damp granular coke breeze. "It is important," the McDowell people say, "to proportion and blend these constituents into a homogeneous, porous burden for the sinter machine."

Two Mixers—To achieve the kind of a mix deemed necessary, the new Youngstown plant has two McDowell-developed Flying Saucers. Each is an 18-ft rotating and inclined saucer-shaped device that gives a turbulent backmixing action and forms the powdered ore and fuel into small pellets ready for sintering. Each of the saucers has a rated mixing capacity of 4850 tons a day.

Before the pellets drop onto a continuous, traveling sintering line 168 ft long (over windboxes) and 8 ft wide (inside pallets), a 1½-in. hearth layer of nut-sized sinter is deposited on the grates. This layer insulates the grate bars against high temperatures, acts as a filter to inhibit trickling of burden or plugging of grate bar apertures, and causes sinter cake to be discharged readily from the grates when the end of the sintering line is reached.

Before the use of a hearth layer, sinter cake had to be jarred loose from the discharge end of old machines. This caused the machines to jerk.

Big User of Air—After being ignited by a stationary furnace using 36,000 cu ft of natural gas an hour, the bed (with a maximum depth of 18 in.) passes over 21 windboxes that pull 390,000 cu ft of air a minute downward through the mass to accelerate the fusing of iron particles.

Upon leaving the sintering ma-

New high speed towboat . . . has power, will travel

The *Sally Polk,* first of the new Dravo-3200 towboats, was clocked at an average speed of 12.9 m.p.h. in trial runs with an 8500-ton petroleum tow. She is now in the New Orleans-St. Louis service of Canal Barge Company, Inc.

Another of these high speed 3200 horsepower towboats, the *Crescent City,* has joined the fleet of Sioux City & New Orleans Barge Line, Inc. Design features developed by Dravo during model basin tests in the Netherlands give the "3200" greater pushpower than other towboats of equal size and power.

A third Dravo-3200 is available for late spring delivery.

For more information on Dravo-3200 towboats, or other products and services, write DRAVO CORPORATION, PITTSBURGH 25, PA.

DRAVO
CORPORATION

Blast furnace blowers • boiler & power plants • bridge sub-structures • cab conditioners • docks & unloaders • dredging • fabricated piping

foundations • gantry & floating cranes • gas & oil pumping stations • locks and dams • ore & coal bridges • process equipment • pumphouses & intakes

river sand and gravel • sintering plants • slopes, shafts, tunnels • space heaters • steel grating • towboats, barges, river transportation

BETTER SINTER . . .

chine, the hot sinter goes into a Dwight-Lloyd straight-line-type cooler where temperature of the material is lowered from 1100 F to around 250 F within 235 ft. The cooler has an active area of 2350 sq ft, compared with 1344 sq ft in the active hearth area.

Sinter cooling is of critical importance to the physical character of the finished product. Rapid cooling, say Dwight-Lloyd engineers, results in a strained, friable sinter which crumbles during subsequent handling.

Partial cooling is accomplished on the machine during the process. As the pallets progress across the machine, the ignition zone, which begins on the surface of the bed, gradually burns down through to the bottom of the bed. At the end of the machine, the top portion is completely sintered and has been draft cooled. The bottom portion is completely sintered but is still red hot.

Air Is Best—Forced air is used in the sinter cooler. Cooling with forced air is desirable, say the Dwight-Lloyd people, in that it results in a strong product which is easily handled on conventional rubber belt conveyors.

To prevent air pollution and to recover dust for re-use, the plant has an electrostatic precipitator which has an efficiency rating of 97.2 per cent.

Color dynamics have been used inside the plant to mark piping, to promote safety, and to encourage good housekeeping. As a further measure toward safety, metal guards have been placed on all potential danger spots around the machinery.

Central Control—All of the sinter plant's equipment is operated from an air-conditioned central control room, where television and many electronic signal switches help the operator keep watch.

Running through the plant are nine major flow lines: Incoming ore, flue dust, fuel, rubble, hearth layer, hot returns, cold returns, dust, and sinter product. The entire system is kept functioning by proportioning belt conveyor scales combined with control devices.

Total length of the conveyors is 8265 ft (3765 ft in the sinter plant and 4500 ft in the screening plant and ore yard system).

Bureau Speeds Sampling

Data processing equipment at the National Bureau of Standards is providing almost immediate information on the uniformity of metals and alloys. It obtains analyses on a direct-reading spectrometer and automatically records them on punched cards which are processed by an electronic computer.

The system is used to prepare standard samples which the Bureau distributes for the calibration of spectrometers in other laboratories. (It issues over 550 different standard samples of chemicals, metals, ores, and ceramics.)

Requests from industry indicate a need for many more samples. Uniform composition is becoming increasingly important.

Equipment — The spectrometer and electronic readout were designed and built by Baird-Atomic Inc., Cambridge, Mass. It provides for analysis of 36 chemical elements, 18 of which may be observed simultaneously.

Operation is fully automatic once the operator has placed the sample in the spectrometer and pushed the starting button. Spectral exposure is made in 30 seconds; the measurements of spectral line intensities are read into the storage unit in 5 seconds and are punched in a card 5 seconds later.

In 3 minutes, the 500 or more measurements for the 18 elements are converted to percentage concentration. Only 7 minutes later, the statistical analysis of the data is completed and the results typed out in convenient form.

Coating Ups Shaft Life

Flame plating has solved a major wear problem on turbineshafts used in the engines that power the Atlas, Thor, and Jupiter missiles.

Engineers at Rocketdyne, a division of North American Aviation Inc., flame plate the shaft with tungsten carbide, then grind and lap the coating to a 0.0015 to 0.0025 in. thickness and a 4 microinch finish. The use of flame plating produces over a 5000-second life of the shaft under severe operating conditions.

Flame plating is a process developed by Linde Co., division of Union Carbide Corp., New York.

How to measure

Now is the time to take a long, hard look

A continuous furnace is more than just a brick-lined structure built to heat a material; it is a processing tool.

Like all processing tools, it must be evaluated on an overall basis. Fuel consumption and efficiency may be completely outweighed by many more-important economic factors centering around your workpiece, your total production program, and your work force.

Your evaluation may well prove that an investment now in Selas continuous heat processing will bring immediate returns in reduced costs and improved product quality.

To help you take this long, hard look at your heat processing equipment or requirements, Selas offers these 15 evaluation factors:

- **Labor requirements**
- **Material saving**
- **Material handling**
- **Floor space**
- **Process coordination**
- **Temperature control**
- **Fuel efficiency**
- **Product value**
- **Equipment flexibility**
- **Automatic operation**
- **Product quality**
- **Production requirements**
- **Work in process**
- **Human element**
- **Maintenance**

The factual report on the facing page tells how a manufacturer of air conditioners took this long, hard look at return-bend brazing. Every evaluation factor proved important; reduced labor requirements alone paid for the Selas automatic brazing machine in 3½ months.

the real cost of automatic heat processing

. . . here's how one SELAS installation stands up under that "long, hard look!"

This specially-designed, custom-built Selas machine silver-brazes pressure-tight joints on air conditioner coils — at production rates — without damage to easily-melted aluminum fins.

Yet heat input is sufficiently high to overcome, during the brazing cycle, the natural tendency of heat exchangers to draw heat away from joint areas. Previous torch method required four highly-skilled workers to equal machine's designed rate of output.

Labor Requirements

One worker operates this Selas Gradiation® brazing machine. Labor cost is now about 20¢ per coil. On a 2-shift-per-day basis, the saving in labor alone paid for this Selas unit in 3⅓ months!

Material Saving

Preplacing of preformed silver alloy rings for automatic brazing assures correct amount of brazing alloy. Hand-brazing invariably results in considerable excess fillets, wasting of costly alloy.

Material Handling

Since the Selas unit is actually a machine-tool type of equipment, it may be located advantageously within the entire production process.

Floor Space

Like all Selas automatic brazing machines, the unit is extremely compact, occupying only 4 feet by 8 feet of the assembly area.

Process Coordination

Selas designed and built this machine to meet *and keep pace* with definite production goals set by the manufacturer of air conditioners. Component by component, operation by operation—the machine is coordinated with the assembly-line type of production.

Temperature Control

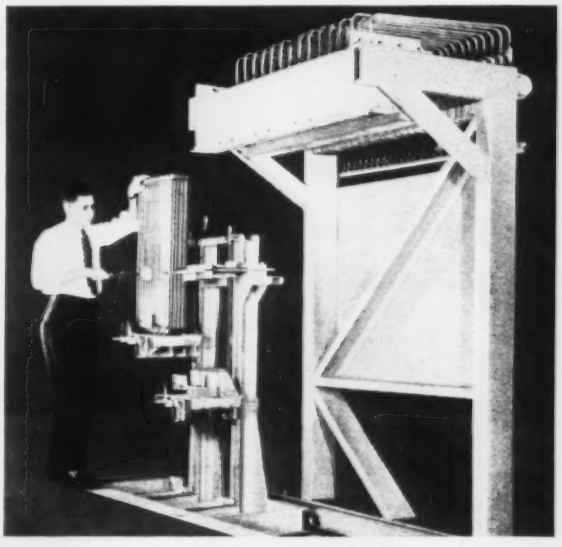
Precise control of heat release rate and exposure time produces uniformly high quality brazing throughout 80 joints of each coil assembly.

Fuel Efficiency

Selas machine uses 200 cfh of natural gas, premixed with air by Selas Combustion Controller. Fuel cost is about ½¢ per coil. Any regular fuel gas can be used. Elimination of bottled oxygen and acetylene resulted in direct fuel cost savings sufficient to pay for Selas equipment in 4½ months!

Product Value

Using the workpiece value at time of brazing, the coils brazed in only 31 hours are worth more than the cost of this Selas machine!



Employing automatic cycling and Duradiant® gas-air burners, this Selas machine silver-brazes tube return bends to copper tubes of aluminum-finned coils at rate of 30 coils per hour.

Equipment Flexibility

Versatility inherent in all Selas automatic brazing machines makes possible the brazing of a variety of workpiece sizes with simple adjustment of fixtures. This machine handles assemblies up to 5½ feet high.

Automatic Operation

Once loaded, workpieces are carried automatically through the brazing cycle. All the operator does is load and push the "Start" button. He is free then to assemble the next coil while the machine completes the brazing.

Product Quality

Each of 80 joints is Selas-brazed tight and leakproof to withstand Freon pressures in excess of 100 psig.

Production Requirements

To keep pace with manufacturer's overall plant production, this Selas machine was designed and custom-built to braze 30 coils per hour. This rate matches production accomplished previously by 4 skilled workers.

Work in Process

At the rate of 30 coils per hour, only one coil is in process at any one time. This represents a 300% reduction in in-process inventory.

Human Element

The skills are built into the machine. Production of brazed coils with all joints pressure tight at rate of 30 coils per hour is not dependent upon ability, judgment or speed of the operator. Actually, the machine paces the operator.

Maintenance

Rugged, welded construction makes for easy, infrequent maintenance. Each machine is factory-tested under production conditions. Each machine is set-up and started-up under Selas supervision in the customer's plant. And, since no operating equipment is better than the service available, Selas stands ready, day or night, year round, to service its equipment on call.

* * *

For case histories covering heat processing operations in steel mills, for heat treating, heating for hot working and brazing, send for reprint "An Economic Appraisal of Continuous Heat Processing." For additional brazing information, ask also for Bulletin "Production Brazing and Soldering," and reprints "Gas-fired Machine Brazing" and "Mechanical Heating puts Brazing on the Production Line." Address Dept. 27, Selas Corporation of America, Dresher, Pa.

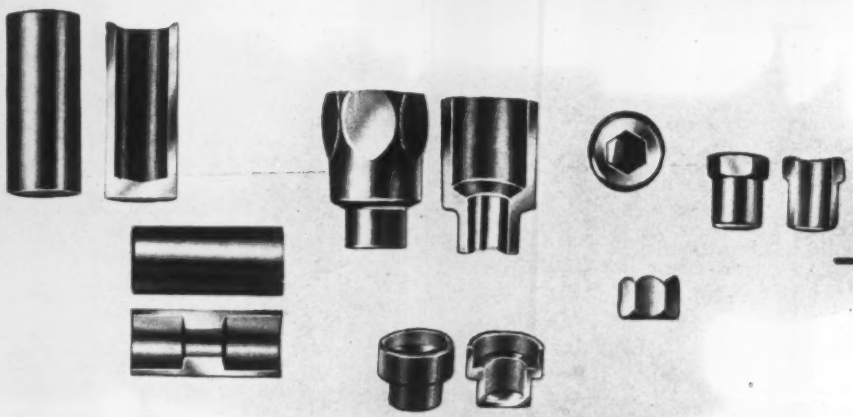
Gradiation and Duradiant are registered trade names of Selas Corporation of America.

SELAS CORPORATION OF AMERICA DRESHER, PENNSYLVANIA

Heat and Fluid Processing Engineers

DEVELOPMENT • DESIGN • CONSTRUCTION

Investigate "Scrapless" by



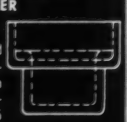
NEW WAY TO

- Increase Production
- Eliminate Secondary Operations
- Increase Tensile Strength
- Hold Close Tolerances
- Lower Material Costs
- Cut Scrap Loss

Here are some actual examples of production savings and improvements achieved by Waterbury Farrel Parts Formers.

PRODUCT: POWER ELEMENT CUP
MATERIAL: DE-OXIDIZED COPPER

OLD METHOD



Formerly produced in two parts on Eyelet Machines from strip metal. Production ran about 55 parts a minute and scrap approx. 17 lbs. per 1000 completed pieces.

WEIGHT OF 1000 PIECES APPROX. 25 LBS.

NEW METHOD

Part is now made in one piece on the PARTS FORMER. Assembly is eliminated, there is no scrap and production has gone up to 100 parts per minute.

PRODUCT: VALVE SEAT
MATERIAL: SAE 1018 STEEL

OLD METHOD

Using rectangular strip and progressive tools, this part was made on a press. Scrap ran as high as 40%.

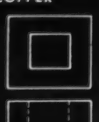
WEIGHT OF 1000 PIECES APPROX. 13 LBS.

NEW METHOD

A PARTS FORMER, using round wire, reduced scrap to $\frac{1}{4}$ lb. per 1000 pieces or approx. 98% savings. 85 valve seats are produced a minute.

PRODUCT: SHADING COIL
MATERIAL: COPPER

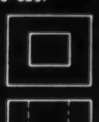
OLD METHOD



Produced on presses from specially rolled rectangular strip. Required tolerances meant 100% trimming. Approx. 8 lbs. of scrap was also produced in 1000 parts.

WEIGHT OF 1000 PIECES APPROX. 10 LBS.

NEW METHOD



Scrap was reduced to $1\frac{1}{2}$ lbs. per 1000 pieces. A savings in raw material was also effected by the use of round wire. The PARTS FORMER is producing 125 parts per minute.

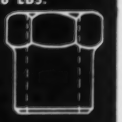
PRODUCT: 5/16" TUBE NUT
MATERIAL: AISI 1108 STEEL

OLD METHOD

Produced on screw machines from hexagon bar stock. Scrap amounted to approx. 28 lbs. per 1000 pieces. Was also made on a Crank Eyelet type machine at a speed of 50 nuts a minute, with scrap slightly less.

WEIGHT OF 1000 PIECES APPROX. 18 LBS.

NEW METHOD

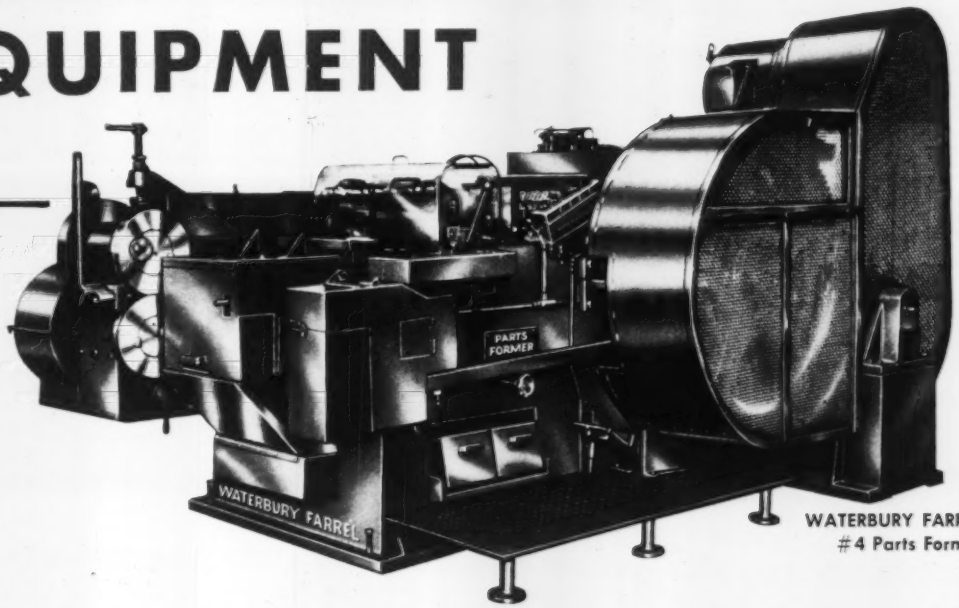


Using round wire, the PARTS FORMER is producing 100 nuts per minute. Scrap is reduced to 3 lbs. per 1000 pieces. A savings of approx. 90% in raw material.

PARTS FORMING

WATERBURY FARREL

COLD HEADING EQUIPMENT



WATERBURY FARREL
#4 Parts Former

Move metal into the shape you want instead of removing it. That's the basic concept and advantage of Waterbury Farrel parts-forming equipment.

At the upper left are a few examples of the tremendous variety of parts which can be formed from round wire by the Parts Former or by related Waterbury Farrel cold heading equipment. These machines have already been thoroughly proven in production. In fact, many metalworking plants are now deriving the benefit of better, lower cost parts production by Waterbury Farrel machines.

As the pioneer in cold forming, Waterbury Farrel knows what this process can do for you. Our engineering staff will be glad to investigate with you the possibilities of cold forming your product. Contact our nearest office or bring your samples and specifications directly to our plant.

Other Waterbury Farrel Cold Heading and Auxiliary Equipment Includes Two Blow and Progressive Headers, also Custom Designed Cold Heading Equipment • Nut Machines • Pointers • Slotters • Thread Rollers and Trimmers.

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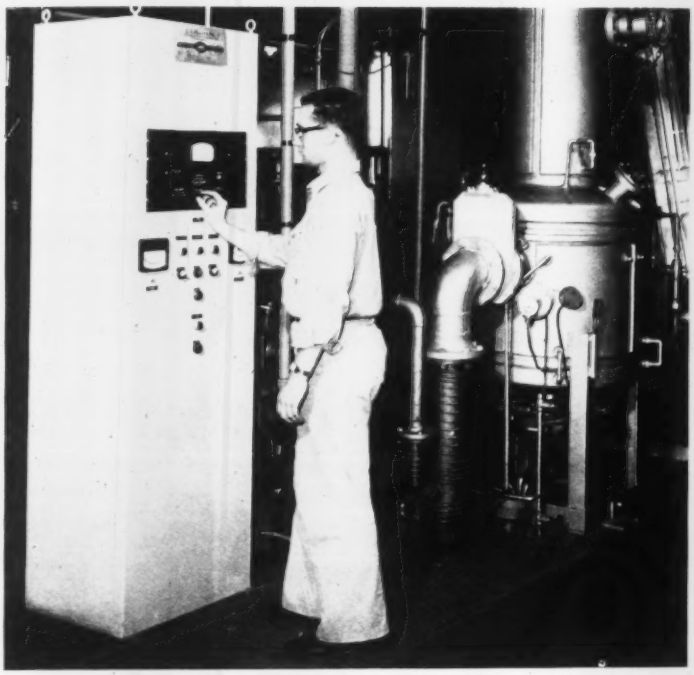


Secret of C. I. Hayes's high temperature design is molybdenum element (center) and concentric radiation shields (three molybdenum; two outer ones, a high nickel alloy). Operator (right) adjusts vacuum pump controls

Furnace Speeds Vacuum Treating

New design features novel heating element and eliminates refractories for faster cooling. Maker says it's a practical production tool that can cut costs

HOW can you get high production out of vacuum heat treating equipment?

C. I. Hayes Inc., Cranston, R. I., says it has the answer in a new furnace design. It promises:

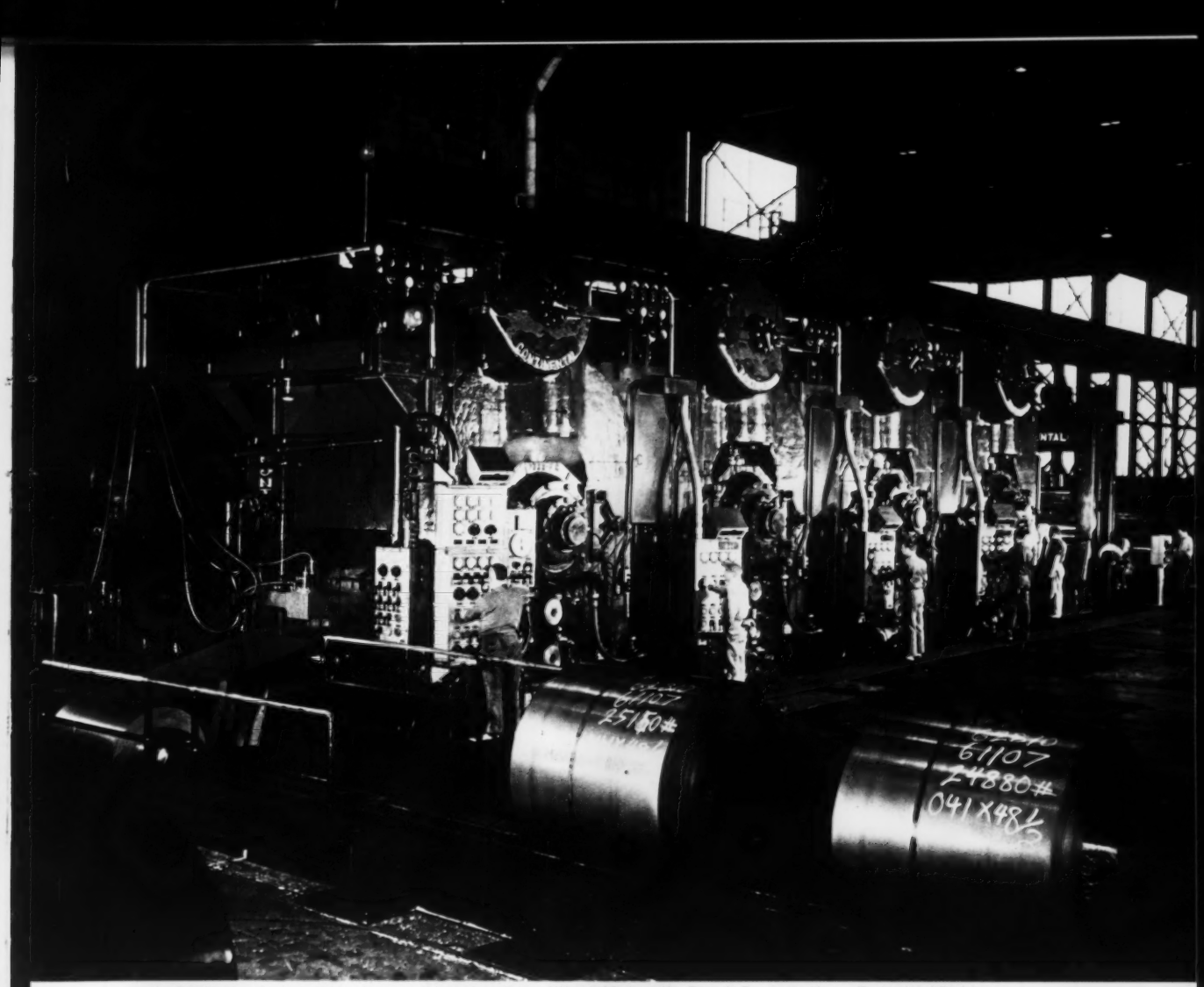
- Fast heating and cooling. (Work can be brought to 3000° F and cooled to 700° F in 1 hour.)
- Fast multiple treatments without removing work from the furnace. (For example, a jet engine alloy can be brazed at 2150° F, diffused at 2050° F, and annealed at 2250° F with almost immediate temperature shifts.)
- Molybdenum sintering at 2800° F.

Overcomes Limitations — Hayes engineers wanted to eliminate these problems usually associated with vacuum equipment: Slow heating and cooling; high voltage losses; high maintenance costs; and an upper heating limit thought by many to be around 2175° F.

To do it, they excluded refractories, made the heating element light and self-supporting, and employed high amperage at only 8 volts.

Five concentric radiation shields keep the heat where it belongs. Chamber walls are water cooled to lower room temperature and speed cooling.

Operation Explained — The top half of the furnace is raised hydraulically and swung to one side. The five-section radiation cover and the workbasket or fixture are attached to the lift hook and raised into the top half. The cover is swung back and lowered onto a Neoprene O-ring seal lubricated with a silicone grease. The load is then lowered and guided into position at the cen-



60-inch, 4-stand tandem cold reduction mill at McLouth Steel Corporation, Detroit, Michigan

BLAW-KNOX COLD STRIP MILLS

Blaw-Knox designs and builds all types of cold reduction and temper mills for ferrous and non-ferrous work. Other Blaw-Knox equipment for the metals industry includes complete rolling mill installations including all auxiliary equipment for ferrous and non-ferrous metals, iron, alloy iron and steel rolls, Medart cold finishing equipment, carbon and alloy steel castings, fabricated steel plate or cast-weld design weldments, steel plant equipment, and heat and corrosion resisting alloy castings.

BLAW-KNOX

BLAW-KNOX COMPANY

Foundry and Mill Machinery Division
Blaw-Knox Building • 300 Sixth Avenue
Pittsburgh 22, Pennsylvania

facts about LEDLOY* FREE-MACHINING STEELS

The Inland process of adding lead to any steel improves machinability from 25 to 50% without affecting mechanical and metallurgical properties

Ledloy is Inland Steel Company's trade name for any grade of steel to which lead has been added to obtain greater machinability. Inland regularly produces Ledloy free-machining open hearth steels to a wide variety of chemical specifications to meet customer requirements. In each instance, regardless of the chemical composition, *the addition of lead by the Inland process results in no significant change in the desirable mechanical and metallurgical characteristics of the steel.* All the important qualities of open hearth steels, such as ductility, impact values, transverse strength, case hardening qualities and cross sectional soundness are retained. Any heat treating, or forging operation that can be performed on similar non-leaded grades of open hearth steels *can be performed* on Inland Ledloy free-machining steels.

What is affected, and to a marked degree, is machinability! Though Inland Ledloy steels contain only about one-quarter of one percent lead, distributed evenly throughout the steel, this small quantity of lead does amazing things to the steel's machinability. On-the-job use consistently shows cold drawn Ledloy can be machined 45% faster than B1113 and 100% faster than B1112. Surface speeds of 325 feet per minute are common and much higher speeds are possible; up to 450 sfm with high speed tools and up to 600 sfm with carbide tooling.

Not only is speed increased, but down-time for tool changes is markedly reduced. The reason is that Inland's process of adding lead to steel lowers the steel's friction component and actually lubricates the cutting tool during machining. Less heat is generated, tool-edge build-up is minimized and tool life is increased considerably.

Ledloy steels' shorter-length chips generally fall clear of the tool and Ledloy's lubricant characteristic aids in preventing chips from welding to the tool.

Ledloy steels are especially clean-cutting and machine to a fine, smooth finish — smoother than that obtained with other free-cutting steels — making dimensional tolerances easier to maintain. In practically all cases, Ledloy steels may be fabricated — sheared, bent, formed, torch-cut, welded, brazed — in the same manner used for steels of the same base chemical composition and with equal or better results.

Many grades available Inland Ledloy free-machining steels are available in a wide range of standard carbon and alloy grades in bar form. Ledloy free-machining plates are also produced.

If your product requires machining, it will pay you to get all the details on Inland Ledloy . . . the original leaded steel. Ask your cold-drawer about it today, or write Inland Steel Company, 30 West Monroe Street, Chicago 3, Illinois, for the interesting booklet, "Properties of Inland Ledloy Steels."

INLAND STEEL

Sales Offices: Chicago • Milwaukee • St. Paul • Davenport St. Louis • Kansas City • Indianapolis • Detroit • New York

INLAND

Ledloy Steels

the world's most machinable

*Reg. Trade Mark

Top swings for loading and unloading. It is raised hydraulically from bottom shell which holds heating element

ter of the heating chamber.

The Hayes design uses a vacuum pumping system based on standards set by the Consolidated Electro-Dynamics Corp., Rochester, N. Y. When the load is in place, a mechanical roughing pump pulls pressure down to 100 microns.

A booster and a diffusion pump then reduce that to a full vacuum in 15 minutes. A low blankoff pressure permits a vacuum of 0.1 micron. Leakage rate is held to about one thousandth of a cubic inch every 4 seconds.

After treatment, the work is raised to the cooling chamber directly above the heating elements. Water jacketing speeds heat removal.

More Practical—Much past vacuum practice, say Hayes engineers, used hot-wall design and an inner retort to contain the vacuum. But most metals can't hold the pressure above 2100° F. Cold-wall design keeps metal closer to room temperatures and there is no retort.

The three-legged heating element replaces refractory-supported coils which frequently short out from condensed metals sublimed at high temperatures in the vacuum. The element is easily changed—you don't have to disconnect gasketed, water-cooled leads.

FASTENERS COST MONEY!

... BIG MONEY! Last year industry spent over $200,000,000 outright for fasteners. And many hidden factors in fastener selection affect production, assembly and maintenance costs! That's why design engineers recognize Chandler as leading manufacturers of dependable "AN", "NAS", "MS" and special bolts. Made from high carbon, alloy, super-alloy and stainless steels, cold-forged Chandler fasteners are precision engineered, produced to close tolerances and constantly inspected to assure maximum resistance to stress, shear, vibration. For quality fasteners mass-produced at a realistic price to meet your special requirements, specify Chandler fasteners by name. Write today for complete information.

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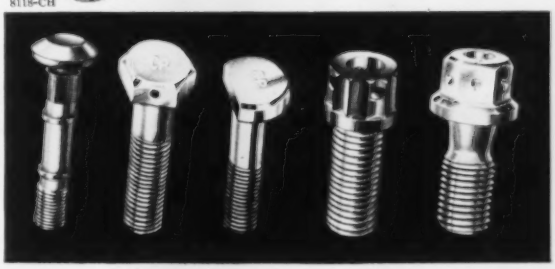

Send today for catalog and "Aircraft Bolt Stock List"

Purchased castings like these are sanded and ground by the company's operators. Dust, formerly exhausted to open air, now passes into a collection unit outside the building

Machine Solves Dust Problem

A central dust collector not only eliminated a housekeeping problem, it improved production through better working conditions. Employees no longer need masks

SMALL plants can handle dust problems efficiently if they will follow the example of William Wilson's Sons Inc., Lansdale, Pa.

Solution—The key is a small, self-contained dust collector. (Pangborn Corp., Hagerstown, Md., makes such devices.) One, called Ventrijet, eliminated the problem for Wilson. Here's how it works.

Dusty air passes through machine hoods at 2000 cfm. As it travels through venturi tubes, it is mixed with small particles of water. The mixture of air and dust impinges at high velocity against surface plates which collect sludge. Deposits wash down into a tank and settle for periodic removal.

Water not removed by the impingement plates deposits on baffles in an eliminator section and drains back into the tank. Only clean air is discharged.

Product—Wilson makes gasoline, kerosine, and oil pumps for truck firms, taxi fleets, farms, and industrial firms. They deliver and record liquids the same way as conventional gas pumps at filling stations. (But they don't record the price.)

All castings in the pumps are purchased. The company machines and finishes them. Cast iron and aluminum particles from two belt sanders and a vertical wheel grinder used to be exhausted outside the plant. They made a mess that upped housekeeping costs. Operators also had to wear masks.

J&L Uses Computer

Analog is new tool for research and experimentation with steelmaking problems

COMPLICATED metallurgical and mechanical processes are simulated on a computer at Jones & Laughlin Steel Corp., Pittsburgh.

The analog is being used to study process control, analyze automatic control systems, and revise information handling and data collection techniques.

The computer is a combination of mathematical analysis and pilot plant study of processes.

Solving a Problem—Equations describing the problem are wired into the computer, using plug-in circuit elements. Potentiometer dials regulate values of the variables. This makes it possible to analyze the influence of one or several changes.

In the simulation of a process, the computer acts like a pilot plant. Data from processes are used to establish a model on the machine. Extreme conditions which might cause serious upsets in production, yield, or quality are studied without interrupting an operating process and avoiding the costly difficulties of upsetting production.

The computer changes variables through thousands of possible combinations in a few hours. The answer is produced in graph form, providing permanent and easy-to-read answers.

The computer produces answers in the form of graphs

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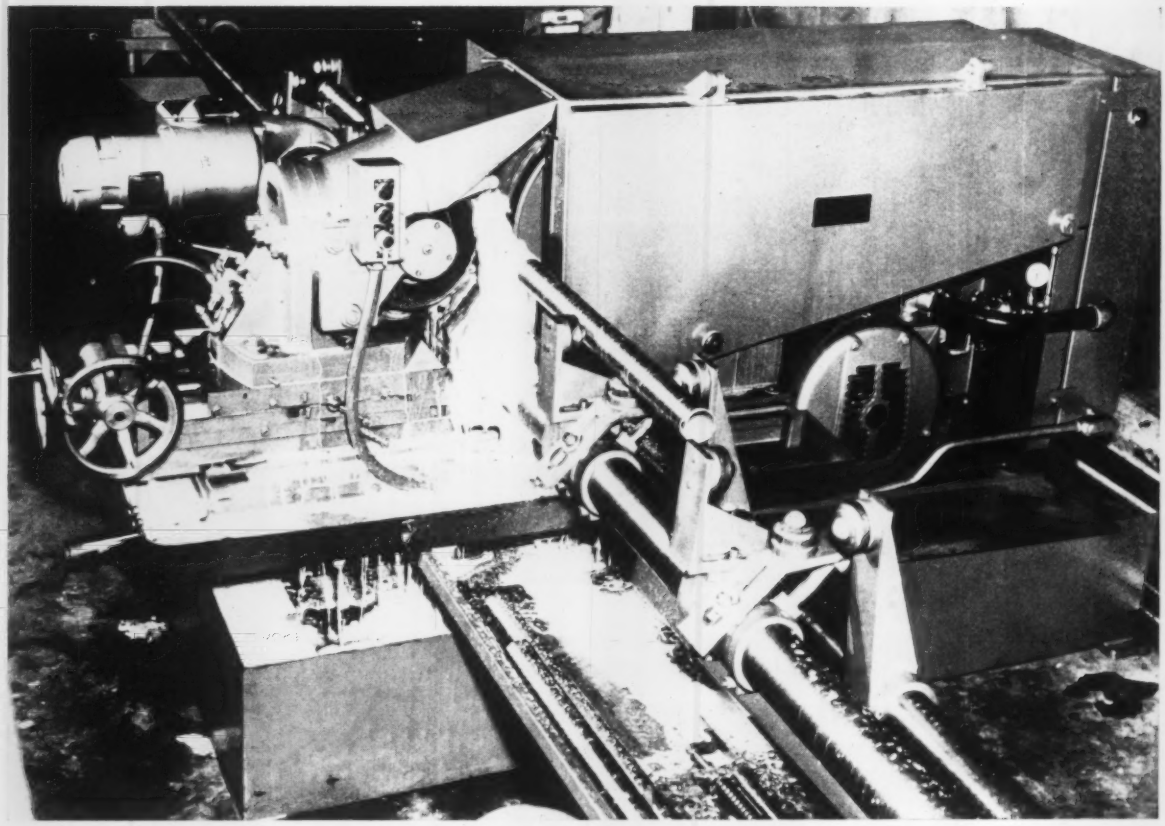
Ask our man! BALTIMORE & OHIO RAILROAD, BALTIMORE 1, MD., Phone: LExington 9-0400



Bar stock up to 25 ft long and 7 in. in diameter is handled in a centerless belt grinder

New Jobs for Belt Grinders

Multiple head machines and conveyor feeding open up many opportunities to combine steps in single operation. Advances in fixtures also add to versatility

ABRASIVE BELT GRINDERS size and accurately finish products ranging from screw drivers to atomic fuel elements. The relatively new machining method offers burr-free cutting action, speed, accuracy, and adaptability. Examples:

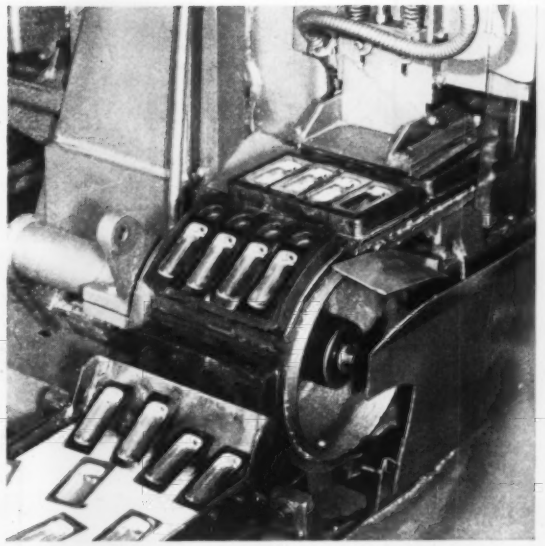
- An annual saving of 8000 manhours is realized by using an automatic grinder for the six grinding and finishing operations on tab and margin racks of typewriters.
- A tolerance of 0.001 in. is maintained while removing 0.005 in. of tool steel from chain saw bars at the rate of 10 ft a minute.
- Over 1000 socket wrenches an hour are sized and finished by removing 0.004 in. in a single pass.

Recent Improvements — Multiple head grinders with conveyor feeding have been an important development. Conveyor feeds eliminate loading and unloading deadtime.

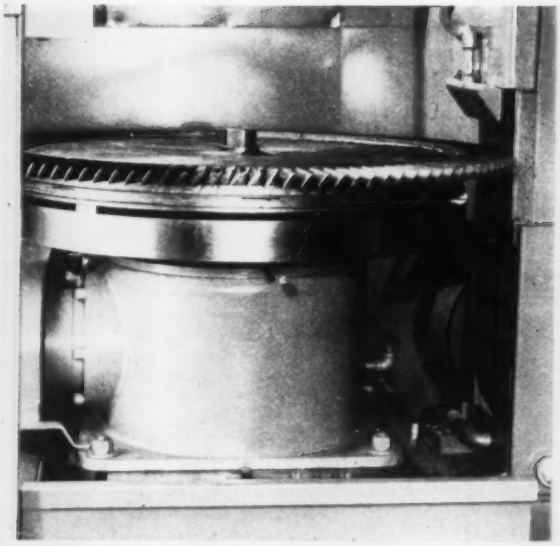
Parts are carried under a series of heads, doing six or more operations in one pass. An unmachined part can be ground to a fine finish in one operation by using progressively finer grits. For operations demanding exceptionally heavy stock removal, identical belts increase production rates.

Belt machines use centerless and surface grinding methods. The free cutting action of the abrasive belt makes it a natural for working fragile parts.

Key to New Uses—Improved design of fixtures is essential to capitalizing on the production and application potential of abrasive belt



Neoprene blocks cemented to the belt make the conveyor serve as a fixture



A rotary table holds jet engine compressor blades as they pass across the face of the belt

grinders, states John Simmons, product manager of Engelberg-Huller Co. Inc., Syracuse, N. Y.

A conveyor can be used as a fixture. A hardware manufacturer cemented Neoprene blocks to the conveyor of a two-head belt grinder used to face brass escutcheon plates.

At International Business Machines Corp., the parts are stacked in a gravity feed rack and an oscillating feed bar pushes them, one at a time, onto the belt grinder's conveyor. The grinder removes excess flash from moldings of beryllium-copper stator components for electric accounting machines.

In the production of jet aircraft rotors at Solar Aircraft Co., San Diego, Calif., a revolving table moves the workpiece against the abrasive belt. Parts are moved back and forth across the belt face by an air-hydraulic device, removing as much as 0.5 in. Belt speed ranges from 2000 to 5000 ft a minute.

Speed Means Savings—A machine for grinding and finishing screw driver blades has upped production 50 per cent by eliminating four machining operations. It has seven grinding heads and a rotary chain drive fixture with 20 chucks. One complete cycle (20 blades through seven operations) takes only 90 seconds.

The grinder for typewriter racks, mentioned earlier, uses four grinding heads mounted in vertical and horizontal sequence, followed by two wire brush heads. Parts are fed at 5 to 30 ft a minute. An air-operated stacking device provides automatic unloading. The racks are made by International Business Machines Corp.

Grinding for Accuracy — Bent, burned, and scored blades for jet engine compressor rotors are ground to a tip-to-tip outside diameter tolerance of ± 0.00125 in. with about 0.008 in. removal. A rotary table holds workpieces 28 to 48 in. in diameter.

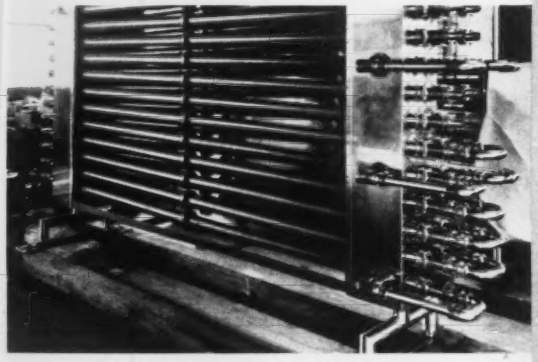
An 8 by 132 in. abrasive belt removes 0.012 in. from automotive countershafts. The finish grind removes an additional 0.002 in. with tolerances of 0.0005 in. total indicator reading. The workpiece moves 7 ft a minute. A reverse feed mechanism allows progressive passes in either direction without intermediate material handling.

Belts Have Soft Touch—A resilient abrasive belt and a rubber backup wheel have a shock absorbing quality that eliminates breakage. The combination is used by General Electric Co., Schenectady, N. Y., to machine extremely brittle atomic fuel elements.

They must be accurately sized to have the proper clearance to move through feeding tubes of reactors. After molding and sintering, uranium dioxide slugs are normally bowed and out of round. They are sized in a centerless grinder, removing 0.003 in. with an accuracy of ± 0.0005 in.

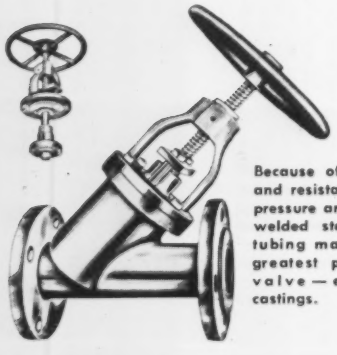
Parts are held in place by a magnetic plate under the belt

In dairy products, sanitation, non-contamination, heat and cold requirements dictate *welded* stainless steel tubing.

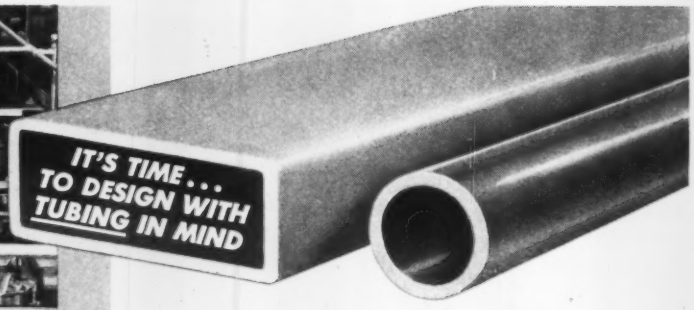


The uniformity, concentricity and dimensional accuracy, and easy fabrication of welded tubing serve best in this condenser.

This all-stainless steel resin distillation unit relies on *welded* stainless steel tubing for all tubular components.



Because of formability and resistance to heat, pressure and corrosion, welded stainless steel tubing makes up the greatest part of this valve — eliminates castings.



WHEN YOU MUST COMBAT

•
•
•

USE WELDED STAINLESS STEEL TUBING

Where corrosion means contamination or failure—where instant sanitation is a must—where temperatures and pressures combine as key factors—where lifetime beauty and durability spell economy—use *welded* stainless steel tubing.

In all these applications for tubing, the uniformity, concentricity, dimensional accuracy and wide range of sizes, shapes and grades of *welded* stainless steel tubing serve best.

It's time to design with tubing from your quality *welded* tube producer.

COMPLIMENTARY TECHNICAL HANDBOOK

260 fact-packed pages of design data for Welded Steel Tubing. For your copy write on your company letterhead and give your title.

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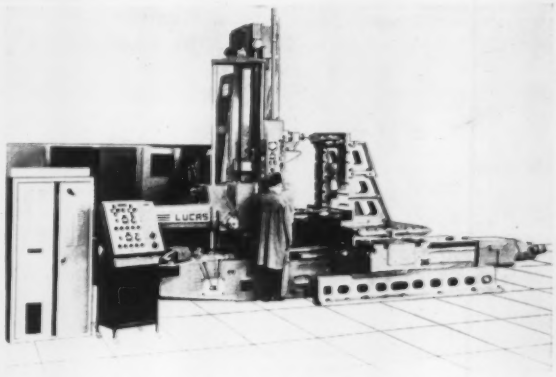
Numerical or Tracer Controls Operate Large Machine

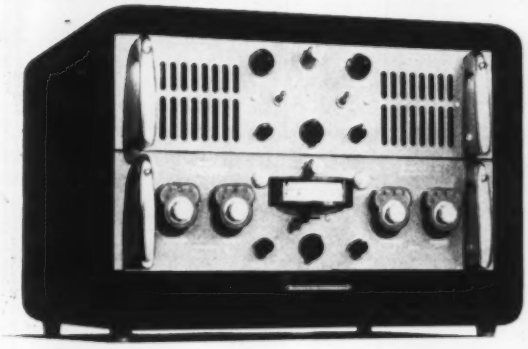
Table and floor type horizontal boring, drilling, and milling machines, equipped with General Electric program controls, can operate as automatic program controlled machines or as standard units. Changeover from program control to standard can be accomplished quickly.

Machines can be equipped with tracer, numerical positioning, or numerical contouring controls.

Numerical positioning is furnished for six motions. These include head, table, saddle, horizontal or vertical rotary table, and spindle feed. Numerical contouring models provide continuous control while milling complex contoured parts. *Write*: Lucas Machine Div., New Britain Machine Co., 12302 Kirby Ave., Cleveland 8, Ohio. *Phone*: Glenville 1-5588



High Speed Flaw Detector Handles Tubing and Bars



The compact, nondestructive Radac automatic flaw detector uses the electromagnetic method. Speed range is 50 to 500 fpm.

The unit detects surface and subsurface cracks, seams, inclusions, and holes. Adaptable to automatic inspection, it will divert rejects into a separate bin. Functions include checking of diameter, wall thickness and eccentricity, also deviations from standard hardness, from alloy composition, heat treatment, and yield strength.

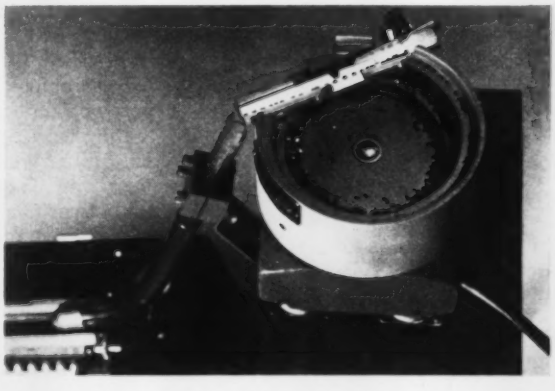
Ferrous and nonferrous tubing, bar stock, and wire in all diameters can be handled. A chart is provided for making adjustments. An unskilled operator can handle it, and the device is completely transistorized. *Write*: Metrol Inc., 17 E. Holly St., Pasadena, Calif. *Phone*: Sycamore 3-3085

Miniature Parts Handled Single File by Feeder

The Micro-Feeder handles 2000 to 30,000 miniature pieces an hour, placing them one at a time into precision sorting and measuring equipment.

The design is based on a standard 5-in. bowl vibratory feeder. A sorting arm places workpieces in single file. They are then moved from a sorting bridge to two gates. The first eliminates piggybacks; the second, doubles. An almost complete automatic classifying operation is possible.

The unit will handle work from 0.001 in. up to 0.250 in. It will feed shapes including rounds, squares, rods, and tubes. Several units can be handled by one man. If noncontamination is a requisite, the device can be placed under a canopy. *Write*: Affiliated Manufacturers Inc., Lebanon, N. J.

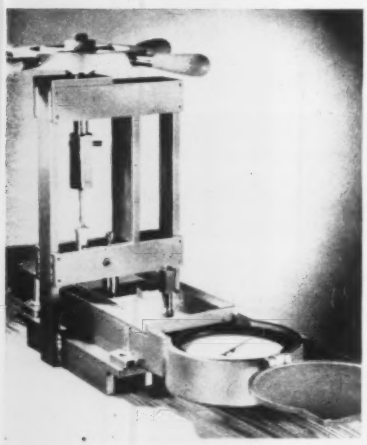


NEW PRODUCTS and equipment

Testing Unit Portable

The Quick-Test hydraulic instrument was developed for preliminary testing and to relieve power-driven testing machines for work requiring more detailed data.

The 47-lb device will test materials for tensile, compression, shear,



and transverse deflection, and will provide up to 160,000 psi using 0.252-in. diameter test samples. *Write*: Truck Scale & Research Corp., P. O. Box 1047, St. Petersburg, Fla. *Phone*: 7-8462

Truck Action Smooth

A fork lift truck, the Tubarlift Champion Stroller, Model 777, has a Hydrowheel fluid drive with a transmission that eliminates sprockets, chains, and gears. Smooth starts and stops are provided with positive hydraulic braking.

The unit is designed to elevate loads up to 1000 lb at heights up to 60 in., and will operate effectively in 60-in. aisles. *Write*: Tubar Lift Div., Uhrden Inc., Dennison, Ohio.

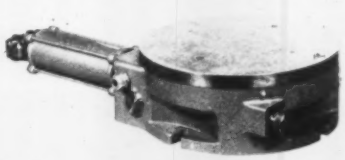
Paint Brush Galvanizing

A priming coat for steel called Poly-Zinc contains 92 per cent metallic zinc. It prevents rust by cathodic action. It can be brushed or sprayed on a prepared surface. *Write*: American Cold Galvanizing Co., 31 Hudson St., Cambridge 38, Mass.

Versatile Table Indexing

The Versi-Table can be set to any index pattern or any number of indexes from four to 24. An adjusting screw at each station will change the locked position from 0 to 15 degrees from its true location.

The table has a skip station arrangement. One, two, three, or five



stations can be skipped per index. Air or hydraulic units are available. They are produced in standard 12-in. diameter models. *Write*: Savage Engineering Div., Lithibar Co., 345 W. 14th St., Holland, Mich. *Phone*: Export 6-5215

Vertical Motor Climatized

This vertical hollow shaft motor (available in ratings up to 2000 hp) is designed for indoor and unprotected outdoor service in industrial pumping applications.

Kingsbury-type thrust bearings are utilized in extra-high thrust applications. The design allows bearing inspection of even the largest motor in 5 minutes.

Low cooling air velocity prevents dust and moisture from being drawn into the motor, 90-degree bends in the air flow system keep out snow and rain, and noncorrosive screens

keep out foreign matter and rodents. *Write*: Dept. P, Louis Allis Co., Milwaukee 1, Wis. *Phone*: Humboldt 1-6000

Miller Handles Heavy Cuts

The QM5 vertical Rigidmil for heavy cuts on large workpieces has longitudinal, transverse, and vertical feed. It has a 50-hp vertical head mounted on a fixed column for maximum rigidity.

Vertical, transverse, and longitudinal feed movements, feed rates, and rapid traverse are all controlled from a swinging pendant which is adjustable to any operating position around the machine.

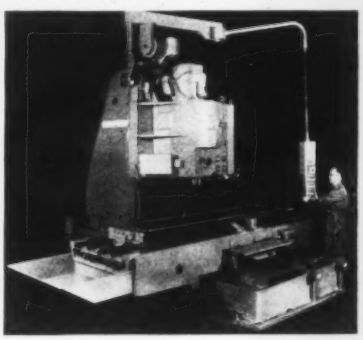
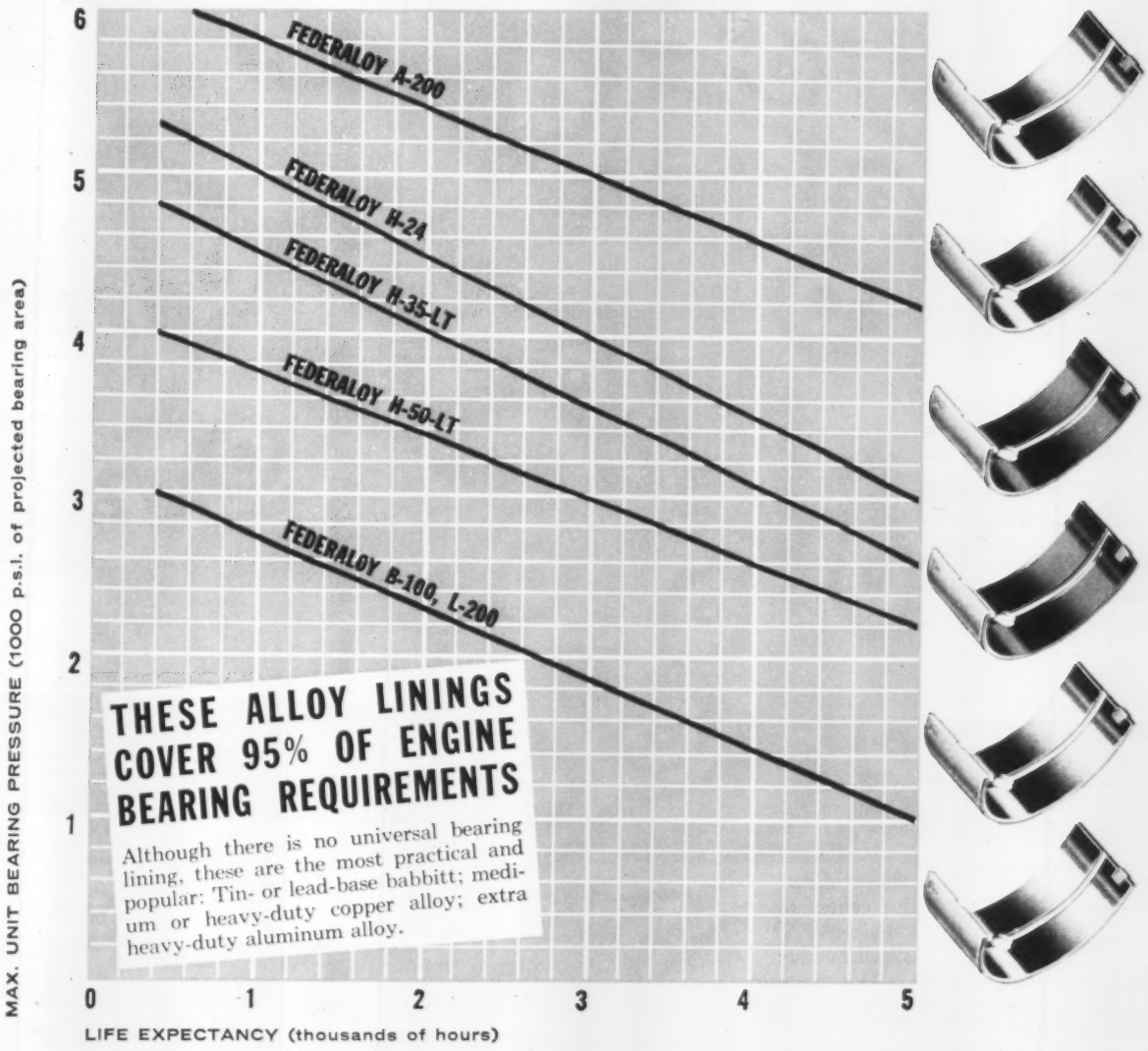


Table movements can be controlled from preset dogs for automatic cycles. *Write*: Sundstrand Machine Tool Co., Rockford, Ill. *Phone*: 2-4477

Boiler Design Advanced

An oil or gas fired, pressurized-furnace steam generator is designed for power, process, or heating loads requiring steam capacities up to 400,000 lb an hour. The design



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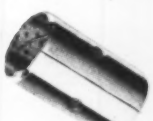
Spacer Tubes


Bimetal Bushings

Plain Bushings

Bearing-Surfaced Thrust Washers

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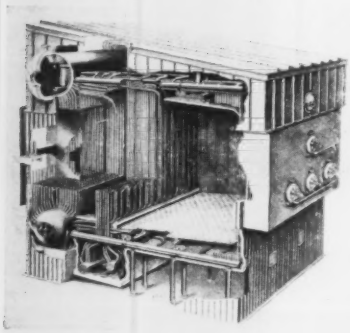
NEW PRODUCTS and equipment



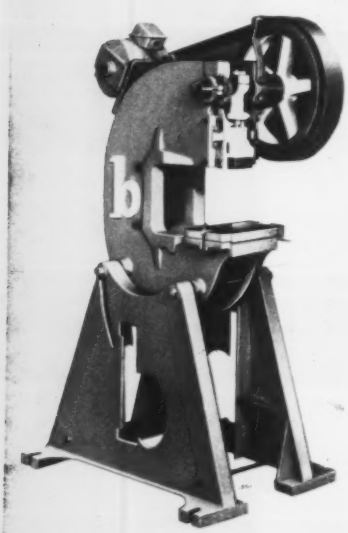
eliminates need for an induced draft fan with subsequent savings in fuel, fan, and power costs.

This Power for Industry boiler is available for steam pressures up to 1150 psi, and for superheated steam temperatures up to 900° F. *Write*: Babcock & Wilcox, 161 E. 42nd St., New York, N. Y. *Phone*: Mulberry 7-6700

Press Has Deep Throat

The 90 Series plain OBI Benchmaster has a standard shut height of 9 in. exclusive of bolster plate. It is available in 12 and 15 in. shut heights. All models have throat depth punching to the center of circles up to 24 in. in diameter.

Plain types deliver approximately 210 strokes a minute. The 8-ton presses are available in back geared models with speeds of about 100 strokes a minute. Bed area measures 8 x 11 in. *Write*: Benchmaster Mfg. Co., 1835 W. Rosecrans Ave., Gardena, Calif. *Phone*: Faculty 1-0411



Racking Made Easy

An automatic turnaround mechanism makes it easy to place parts on racks on their way to an anodizing machine. Swivel devices turn racks one side out and then the other as they move along a monorail.

The mechanism saves labor and time, and provides an efficient adjunct to automated systems. Where stripping of racks is not required, load and unload monorails may be continuous. *Write*: Hanson-Van Winkle - Munning Co., Matawan, N. J. *Phone*: Matawan 1-1000

Measuring Roughness

The Profilometer Group III for measuring surface roughness has a roughness width cutoff selection of 0.010, 0.030, and 0.100 in. Surface

measurements can be made on $\frac{1}{8}$-in. inside diameters to flats and on $\frac{1}{8}$-in. outside diameters to flats.

The Type QC amplimeter shows arithmetical or rms average roughness height, as selected by a panel switch. It has six ranges—0 to 3, 10, 30, 100, 300, and 1000 microinches. *Write*: Micrometrical Mfg. Co., Ann Arbor, Mich. *Phone*: Normandy 2-5626

Controlled from Platform

Operators of rider-type, high lift, JackStaker material handling trucks drive while standing.

Controls for steering, lifting and lowering, and driving in forward or reverse are on the truck platform.

Trucks (with forks or platforms) are available in capacities from 1500

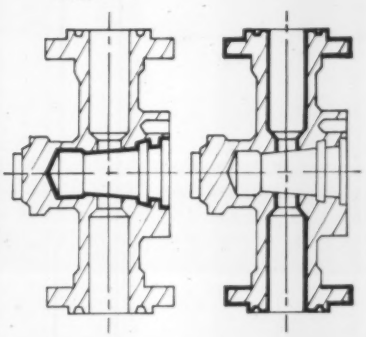
Let me show you*

**Bob Marr,*
P&J Representative
Houston, Texas
Telephone: MOhawk 7-3964

how two P&J Automatics helped Rockwell Manufacturing Co.

JOB FACTS:

PART: *Valve Body*
MATERIAL: *Steel Forging*
REQUIRED: *A series of 22 roughing and finishing cuts involving very heavy metal removal*
THE MACHINES: *2 P&J 4-U Automatic Turret Lathes*
THE RESULTS: *A part completed in only 3 fully automatic cycles... with machining time reduced 71%.*



FIRST OPERATION

SECOND OPERATION

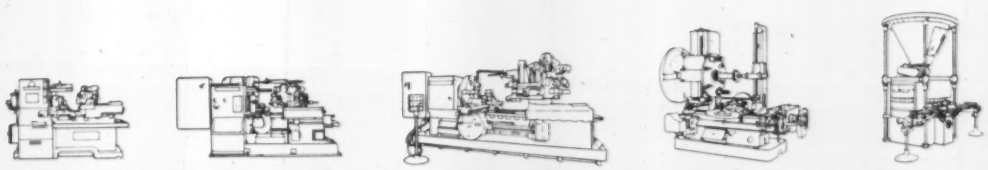
BLACK AREAS INDICATE METAL REMOVED

. . . . REDUCE MACHINE-HOURS 71%!

The Rockwell Manufacturing Company of Sulphur Springs, Texas, a leading producer of valves for petroleum and other industries, was using hand-type turret lathes to produce finished valve bodies from rough steel forgings. Looking for a way to reduce costs on this operation, Rockwell purchased two Potter & Johnston 4-U Automatic Turret Lathes. Machine-hours for this operation have been reduced 71% and man-hours have been reduced 86%. In addition, the hand machines and their operators have been released for other work they can handle more profitably, and overall plant production has been increased.

If the parts *you* manufacture require a series of complex cuts, a P&J Automatic can bring you important savings in time and money by producing these parts in a high-speed, fully automatic cycle. And you'll find that P&J Machines are recognized for their ability to take continuous heavy-duty operation in stride.

Act now. Ask the P&J Representative in your area to recommend a production plan for your specific needs. Or, if you prefer, write direct to Potter & Johnston Company, Pawtucket, Rhode Island.

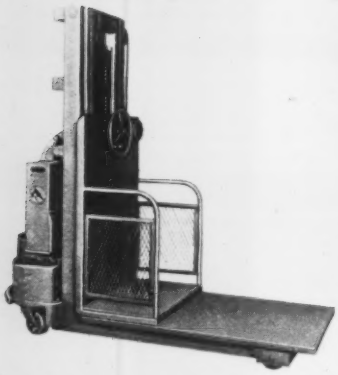


AUTOMATIC TURRET LATHES . . . GEAR CUTTERS . . . PACKAGING MACHINES

POTTER & JOHNSTON

SUBSIDIARY OF PRATT & WHITNEY COMPANY, INC.

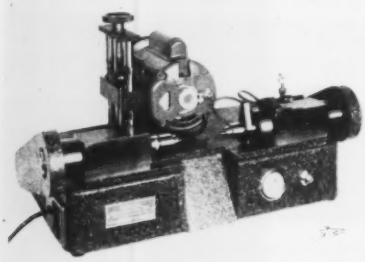
PRECISION PRODUCTION TOOLING SINCE 1898



to 3000 lb. Each unit has a 3½ ft high screen guard on either side of the operating position. They are offered in fork or platform models, and standard over-all lengths of 81, 87, 93, 99, or 105 in. *Write*: Dept. R8-11, Lewis-Shepard Products Inc., 125 Walnut St., Watertown 72, Mass. *Phone*: Watertown 4-5400

Deburrs without Torque

Deburring both sides of holes from 1/32 to ½ in. diameter can be done economically on this opposed spindle machine.



Spindles rotate in opposite directions, eliminating cutter torque. Spindles are air operated. *Write*: Model Machine Co. Inc., 4729 Hawthorne St., Philadelphia 24, Pa. *Phone*: Cumberland 8-4565

Solvent Cleans Cold

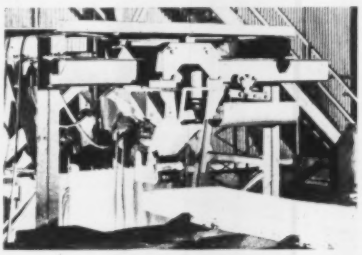
Emulsion Cleaner 62 provides rapid, cold cleaning of all metals to remove heavy oil films and solid dirt. It can be obtained ready for use or as a concentrate.

Simple immersion in the cleaner at room temperature for 5 to 60 seconds followed by a cold water rinsing is sufficient to preclean metals preparatory to plating, phosphating, or blackening. It will absorb high concentrations of oil and grease before becoming inoperative. The product is neutral and will not attack such reactive metals as aluminum, zinc, brass, or magnesium, and it does not contaminate alkali electrocleaners that may be used following precleaning. *Write*: Enthone Inc., 442 Elm St., New Haven, Conn. *Phone*: Spruce 7-5581

Mill Products Marked

Slabs and blooms are stamped by this remotely controlled Mecco marker.

The unit has a pneumatically powered stamping head (it can take up to nine marking wheels), a trolley mounted mechanism for horizontal positioning, and a console for actuating the stamping



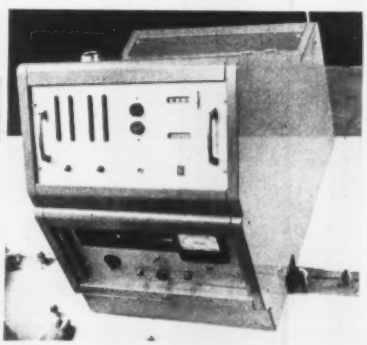
cycle and changing characters in the marking head.

Clear cut impressions are obtainable when scale is present. *Write*: M. E. Cunningham Co., 1038 Chateau St., Pittsburgh 33, Pa. *Phone*: Allegheny 1-3280

Small Parts Inspected

The Atomonitor employs radioactivity to inspect production line assemblies for the presence of hidden vital parts at rates up to 3000 an hour.

Applications include the inspection of artillery-shell fuse heads, instruments, electrical and electronic apparatus, motor components, or almost any small device in which

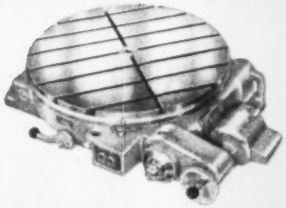


Check this Complete Line of

PRATT & WHITNEY

Precision

ROTARY TABLES



HORIZONTAL ROTARY TABLES

- 12-Inch Hand Operated
- 20-Inch Hand Operated
- 24-Inch Motor-Driven
- 30-Inch Motor-Driven
- 42-Inch Motor-Driven
- 50-Inch Motor-Driven

OPTICAL ROTARY TABLE

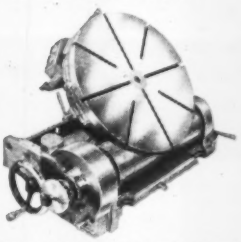
- 24-Inch Horizontal

AUTOMATIC INDEXING

- 42-Inch Horizontal

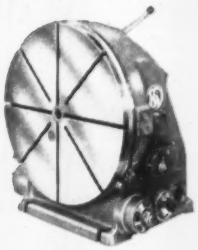
NUMERICALLY CONTROLLED

- 42-Inch Horizontal



TILTING ROTARY TABLES

- 10-Inch Hand Operated
- 16-Inch Hand Operated
- 24-Inch Power Rotated
- 36-Inch Power Rotated



VERTICAL ROTARY TABLES

- 30-Inch Motor-Driven
- 48-Inch Motor-Driven

NUMERICALLY CONTROLLED

- 30-Inch Vertical

PRATT & WHITNEY

Equipped with Numerical Control, this Pratt & Whitney 42" Rotary Table is bringing new standards of speed and efficiency to high-precision work involving circular spacing or angular positioning.

Send for FREE Circular

PRATT & WHITNEY COMPANY, INC.
Charter Oak Blvd., West Hartford, Conn.

Please send my free copy of your Circular No. 619, describing all 16 sizes and models in the Pratt & Whitney line of Precision Rotary Tables.

NAME _____

POSITION _____

COMPANY _____

CO. ADDRESS _____

CITY _____ ZONE _____ STATE _____

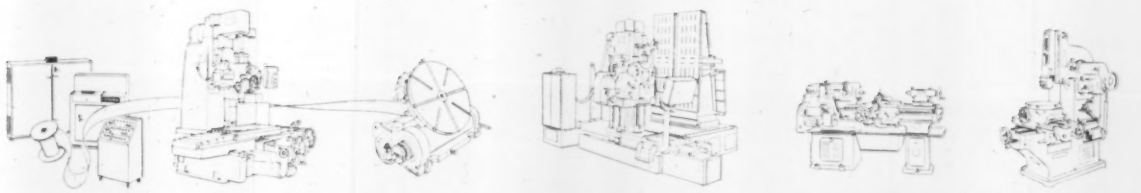
16* PRECISION ROTARY TABLES To Choose From!

Whatever your requirements on jobs involving accurate circular spacing or angular positioning, you'll find the *right* rotary table in our complete line. All of the 16 available sizes and models are accurate to a few seconds of arc . . . and if you require the ultimate in precision, the P&W Optical Rotary Table has a guaranteed overall accuracy of *3 seconds of arc*. This is *real accuracy* when you realize there are 1,296,000 seconds in a complete circle!

P&W Rotary Tables are built for ruggedness and stamina as well as precision. Whether you use them in conjunction with jig borers and other tools to save time and set-up in machining operations . . . or by themselves for faster, more accurate inspection, circular graduating or layout . . . P&W Rotary Tables will take continuous, heavy-duty work in stride.

Get all the facts on the 16 sizes and models of Pratt & Whitney *Precision* Rotary Tables now. See how one of these tables can bring new speed, accuracy and economy to your operations. Use the coupon above to send for your copy of our new circular, which tells you all about these precision rotary tables.

Pratt & Whitney Company, Inc.,
13 Charter Oak Blvd., West Hartford, Conn.



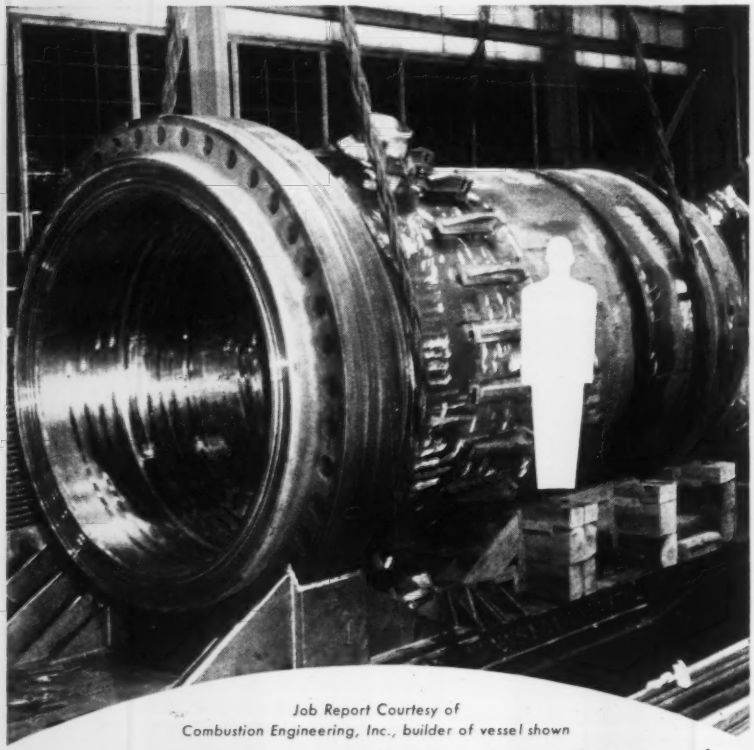
NUMERICAL CONTROL . . JIG BORERS . . ROTARY TABLES . . . KELLER MACHINES . . . LATHES . . . VERTICAL SHAPERS

PRATT & WHITNEY

FIRST CHOICE FOR ACCURACY

MACHINE TOOLS • GAGES • CUTTING TOOLS

This WELDED nuclear pressure vessel holds a practical idea for you

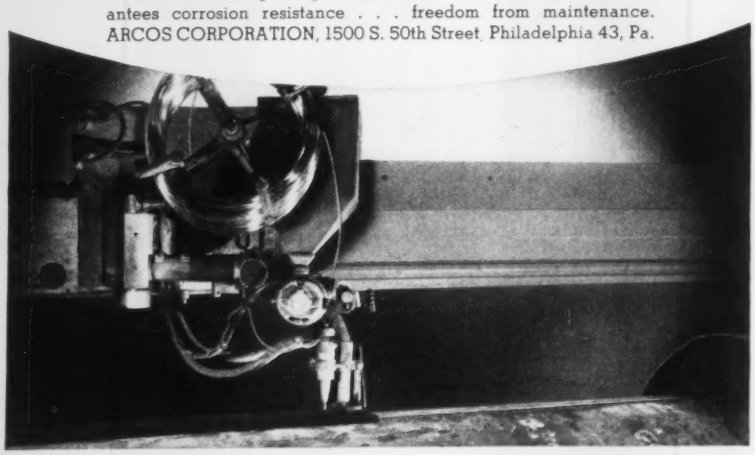


Job Report Courtesy of
Combustion Engineering, Inc., builder of vessel shown

USE ARCOSITE FLUX

for submerged arc welding

In nuclear installations where radio activity makes weld failure dangerous to personnel and can cause indefinite shutdown, sound corrosion resistant welds are of utmost importance. To inhibit corrosion, portions of the 9 ft. dia. interior of this 33 ft. reactor were overlaid with ¼ in. of 308L weld metal. Submerged arc welding with ARCOSITE S4 flux was used for the job. The girth and longitudinal joints of the low alloy steel plates were also submerged arc welded using ARCOSITE B5 flux. Cost-wise, no other conventional method of cladding was practical. Arcos weld metal quality guarantees corrosion resistance . . . freedom from maintenance. ARCOS CORPORATION, 1500 S. 50th Street, Philadelphia 43, Pa.



NEW PRODUCTS and equipment

the vital part cannot be seen or felt after assembly. *Write*: NRD Instrument Div., Nuclear Corp. of America, 400 Park Ave., New York 17, N. Y. *Phone*: Plaza 8-0700

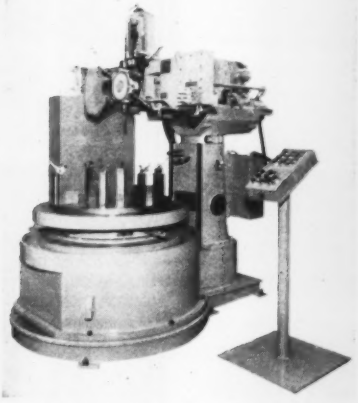
Freezer Cools Rapidly

A 180-cu ft industrial freezer will cool 500 lb of AM-350 stainless steel from ambient temperature to − 125° F in 60 minutes.

Austenitic stainless steel and tools are stabilized quickly and safely. Complete transformation of austenite to martensite is accomplished without warpage, excessive scaling, or distortion. *Write*: Dept. PW-297, Webber Engineering Corp., P. O. Box 217, Indianapolis 6, Ind. *Phone*: Melrose 4-5855

Special Changed Readily

This special Burgmaster radial turret drill is built up from standard components and a standard autoindexing circular table. The machine is supplied as a complete, automatic unit ready for production—including tools, fixtures, machine, and hydraulic power.



The unit is arranged for center drilling, drilling, and tapping bolt circles having 8, 13, and 16 hole patterns.

Although made to handle a certain workpiece, the machine can be readily changed over to another piece of radically different design. *Write*: Burg Tool & Mfg. Co., 15001 S. Figueroa St., Gardena, Calif. *Phone*: Davis 9-4158

NEW literature

Write directly to the company for a copy

Roller Conveyors

This booklet describes three lines of stock roller conveyors. One has a turnover feature for setting rollers high or low. Another is being produced in aluminum and lightweight steel. The third has a multiple punched frame for greater variation in roll spacing and length. Logan Co., 200 Cabel St., Louisville 6, Ky.

Swaging Machines

A brochure describes electrohydraulic, die closing, rotary swaging machines. They are designed to make reductions in diameter on rods, heavy tubes, or other parts which cannot be reduced by standard rotary swagers. Swaging Machine Div., Torrington Co., Torrington, Conn.

Bandsaws

A catalog contains information on saws, stock stands, and accessories. Johnson Mfg. Corp., Crystal Street, Albion, Mich.

Vertical Motors

Brochure MM161 describes vertical hollow shaft motors for turbine pumps: 1 to 700 hp weather protected, and 1 to 500 hp totally enclosed and explosion proof models. Electric Motor Div., A. O. Smith Corp., Tipp City, Ohio.

Lift Truck Attachments

A catalog of mechanical and hydraulic lift truck attachments illustrates 26 ways for owners to get more use from their trucks. Little Giant Products Inc., 1570 N.E. Adams St., Peoria 3, Ill.

Electric Plants

A brochure describes electric generating plants for standby or constant use. Sets range from small, air-cooled units to large, diesel portables ranging up to 300 kw. Jetapower Div., Jeta Metal Fabricators Inc., 957 Saw Mill River Rd., Yonkers 2, N. Y.

Handling Equipment

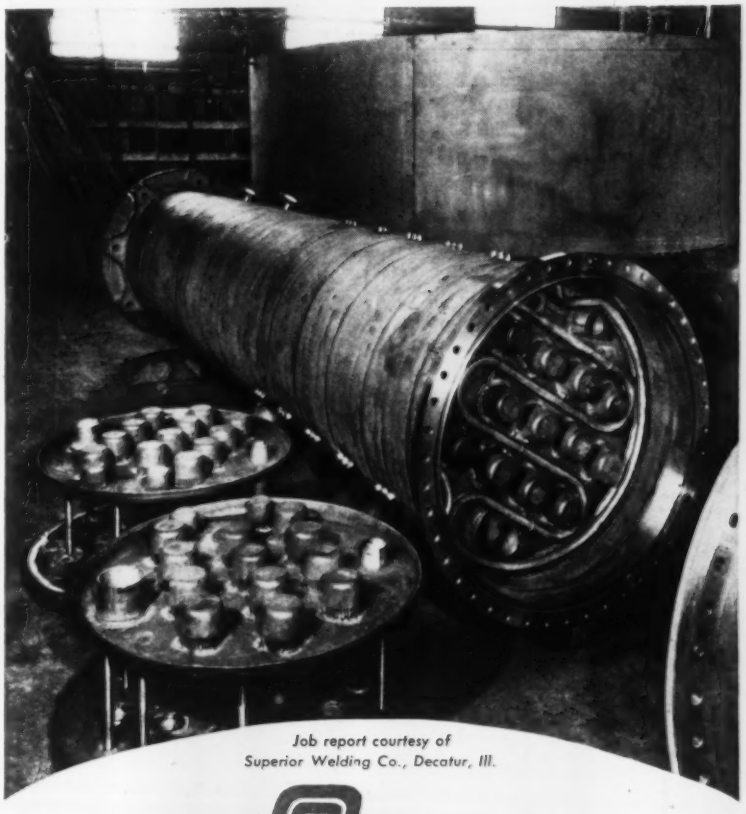
Catalog No. 90 describes a variety of corrugated steel boxes, skids, and pallets for unit load handling. Union Metal Mfg. Co., Canton 5, Ohio.

NEW BOOKS

Brass and Bronze Foundry Practice, Harry M. St. John, Penton Publishing Co., 1213 W. Third St., Cleveland 13, Ohio. 244 pages, $8.00

This volume brings together the facts and theories of brass and bronze foundry practice. It covers alloys, technical and operating procedures, quality control, testing, brass foundry economics, cost control, casting design, patternmaking, foundry layout, and salvage of waste materials. A complete index extends the reference capacity of the work, and 85 illustrations clarify subject matter.

When corrosion is a threat to the life of Stainless Welds



Job report courtesy of Superior Welding Co., Decatur, Ill.

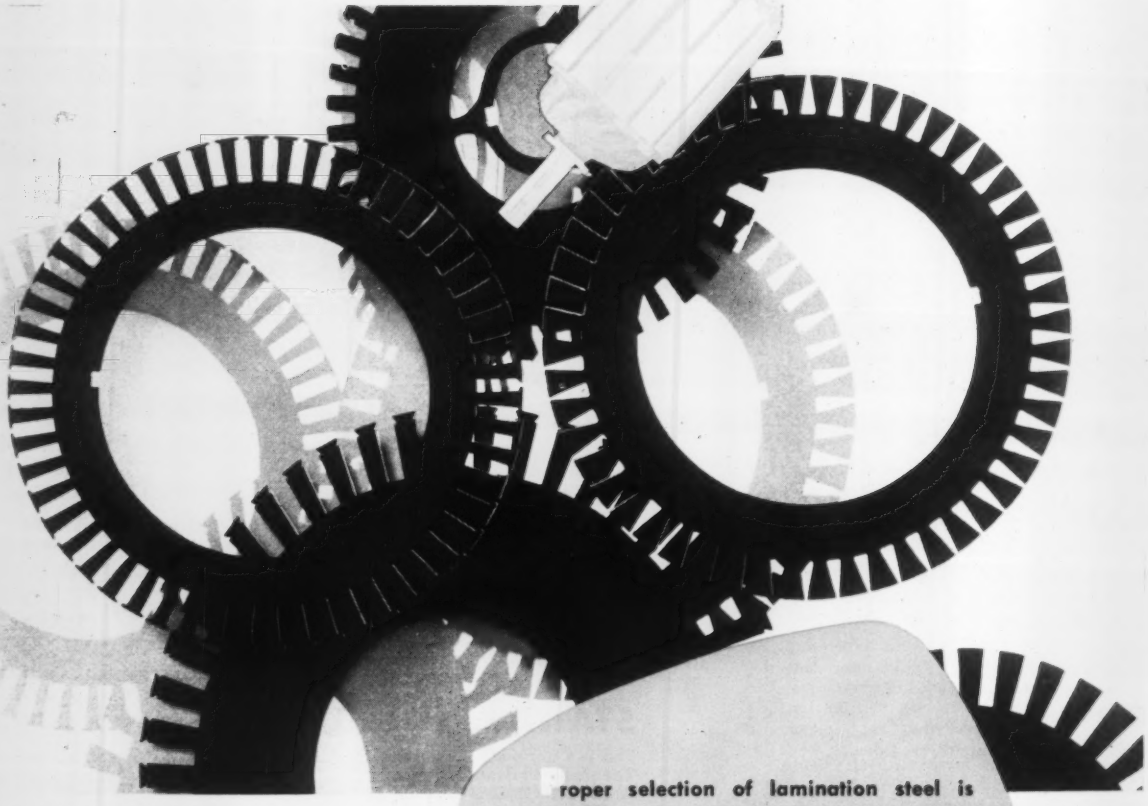
WELD WITH ARCOS

STAINLESS ELECTRODES

This is a nitric acid absorption column for the chemical industry. The shell and flanges of solid 304 ELC stainless were welded with Arcos CHROMEND 19-9 Cb Electrodes to resist chemical attack at 150 p.s.i.g. and 300 F. Arcos CHROMEND K-LC Electrodes were used for welding the bubble caps and coil clips. Together, these two Arcos Electrodes proved the point: there's no substitute for quality weld metal when long uninterrupted service is essential. ARCOS CORPORATION, 1500 South 50th Street, Philadelphia 43, Pa.

Acme-Newport Steel

ELECTRICAL SHEETS TO PRECISE SPECIFICATIONS



PRODUCTS OF ACME-NEWPORT STEEL

Hot Rolled Steel in Coil
Hot Rolled Pickled Steel in Coil
Hot Rolled Sheets
Hot Rolled Pickled Sheets
Cold Rolled Steel in Coil (*full hard only*)
Cold Rolled Sheets
Alloy Sheets and Plates
Plates (5/16" *and lighter*)
Electrical Sheets
Electric Weld Line Pipe

Acme-Newport Steel COMPANY

NEWPORT, KENTUCKY

A SUBSIDIARY OF ACME STEEL COMPANY

Proper selection of lamination steel is critical to the final operation of motors, generators and other types of electrical equipment. Every application requires expert balancing of steel costs with necessary performance characteristics, gained through special attention to core-loss properties, permeability, gage structure and punching qualities.

Acme-Newport has the technical knowledge, the modern facilities and scientific control to meet your exact requirements in electrical steels, or any other of the products listed here. Call or write today.

EXPEDITE YOUR RUSH ORDERS WITH . . . RED CIRCLE SERVICE

Market Outlook

Automakers Wield Big Stick

ALTHOUGH THEY'RE less vocal in their opposition to higher steel prices than Sen. Estes Kefauver (D., Tenn.), automakers are not secretive about their stand. They're dead set against any increase.

Chevrolet made that clear when it told bar suppliers outside the Detroit area to "get competitive" with prices being quoted by Great Lakes Steel Corp. Although they felt the volume of business wouldn't justify absorbing an additional $2 a ton in freight, distant producers went along with the ultimatum. They weren't about to risk alienating a potentially big customer.

Automotive buying of finished steel is down markedly this year (3.3 million tons, vs. 6.1 million in the like period of 1957), but there has been no lessening of the carbuilders' influence on prices. They still represent 15 per cent of the market. With their concentrated buying power, they can resist increases much more effectively than steel service centers (warehouses) or construction industries.

HIGHER PRICES IN AUGUST?— Although second quarter earnings of most steel companies will probably surpass those of the first three months, some producers will only reduce their losses. They regard higher prices as a matter of the greatest urgency and wish U. S. Steel Corp. would take the lead. Whatever its reasons for waiting, Big Steel is being credited with good strategy. Says a union source: "By postponing a price hike until August or September, they'll be able to say that they tried their best to live with higher labor costs, but just couldn't do it. They'll assemble some figures during this period of 'clarification' to substantiate their claim."

DISTRIBUTOR SALES IMPROVE— Better demand for steel from the construction industry and from manufacturers whose inventories had reached the danger point boosted warehouse sales during May and June. Chicago and other regions heavily dependent on agriculture showed substantial increases in shipments. Areas tied to the automotive and capital goods industries reported only modest gains. Warehouse operators forecast gradual improvement during the fall but won't increase their inventories (3.7 million tons).

JULY LOOKS BETTER— Order books aren't filling up as fast as they did in June, but it's clear that July's entries will be considerably better than steelmakers expected. Demand continues strong for construction products, galvanized sheets, and tin plate. Agricultural implement manufacturers are buying steadily; miscellaneous users are replacing depleted inventories.

INGOT RATE CLIMBS— Responding to improved sales prospects, steelmakers boosted their operating rate 2 points last week to 55.5 per cent of capacity. Production was about 1.5 million net tons of steel for ingots and castings. The biggest gain was scored at Cleveland where Jones & Laughlin Steel Corp. resumed open hearth operations after a four-month shutdown. STEEL's composite scrap price rose 84 cents last week to $36.67 per ton.

APPLIANCE OUTLOOK— "Household appliance manufacturers will be ordering better tonnages by August or September," a sales manager predicts. "For the last three months their steel inventories have been at rock bottom, but they've had big stocks of finished goods on hand. Now there seems to be an upswing in retail sales which is cutting into the stocks. Before long, appliance makers will be buying as much steel as they're using."

WHERE TO FIND MARKETS & PRICES

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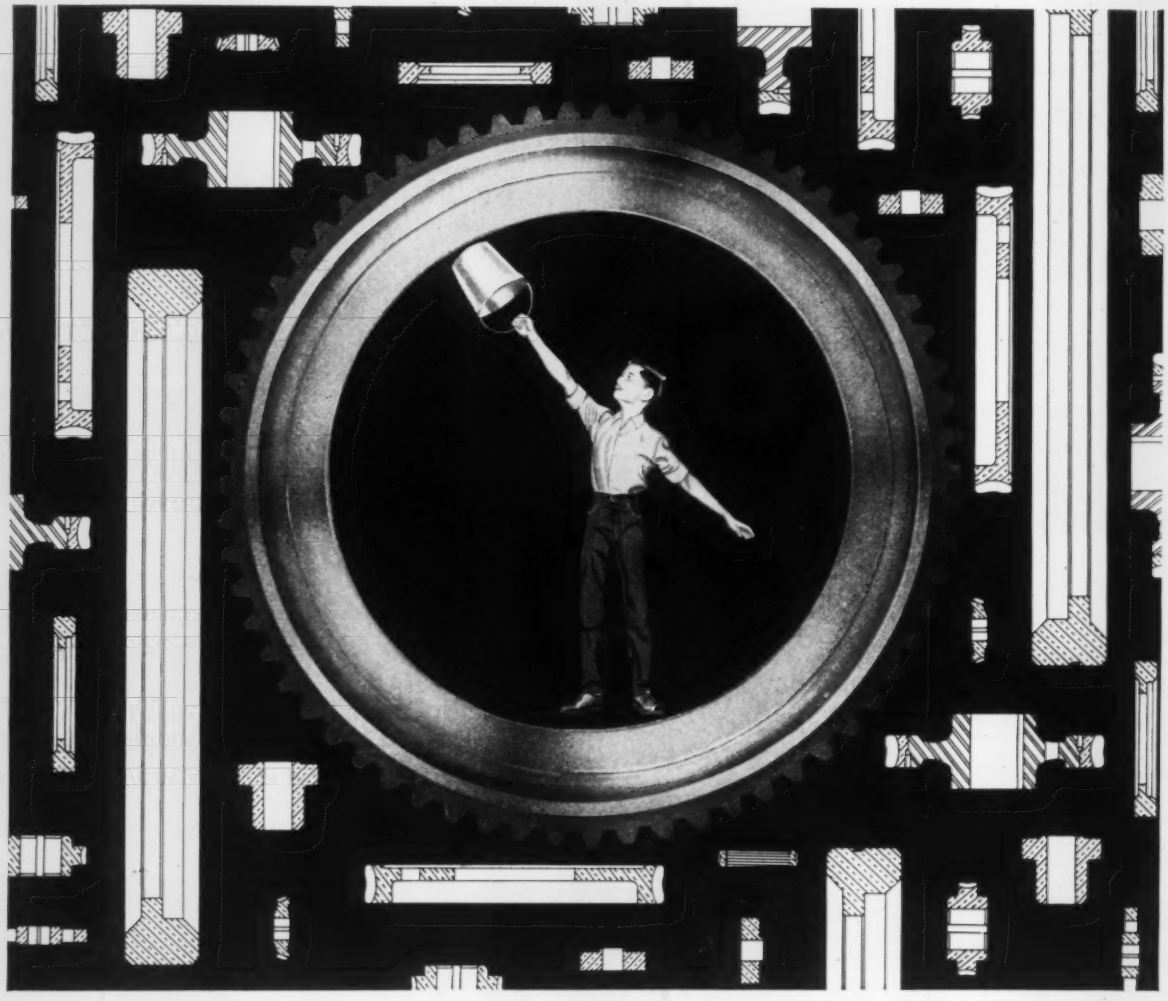

Centrifugally cast gear blanks...in BRONZE ...are stronger, last longer!

Big gears and intricate shapes — our specialty!

We cast many blanks centrifugally . . . in sizes up to and even beyond 72" in diameter. Because centrifugally cast gears have proved their added strength, toughness and long-wearing characteristics for many problem applications.

Laboratory testing and field experience show that physical and mechanical properties of centrifugal castings are as much as 10-15% better than those of most static castings.

But whatever the shape or size of the gear blank NBD can cast it for you (centrifugally or statically) in gear bronze, aluminum bronze, manganese bronze —to your specifications. Want iron or steel hubs cast in? We can do it. Want castings furnished rough, rough machined, or finished machined? Want sand castings, shell moldings, chilled rim or chilled three sides? You name it.

Take advantage of NBD's experience. Three strategically located plants are available to give you fast service. Call or write for quotes or information.

AMERICAN Brake Shoe COMPANY

NATIONAL BEARING DIVISION

717 Grant Building, Pittsburgh 19, Pennsylvania

PLANTS IN: CHICAGO, ST. LOUIS, MEADVILLE, PA.

Haynes Stellite Co., a division of Union Carbide Corp.

Investment Casting Sales Slip

	Millions
1958	$ 85
1957	104
1956	115
1955	102
1954	86
1953	80

Estimated by Investment Casting Institute.

Investment Castings Down

Sharp defense cutbacks trigger slump, forcing the industry to seek new commercial applications and push technological developments. Brighter future expected

INVESTMENT CASTING sales through May were 29 per cent off last year's pace. The industry expects late 1958 business to partially make up the loss. Sales are expected to wind up 18 per cent under 1957's.

Backlogs in May were 37 per cent below those in the same month last year.

U. S. Buys Less—Sharp cutbacks in defense buying since 1957 are blamed for the slump. Aircraft and missilework, which accounted for 70 to 80 per cent of 1957's business, are down to 50-60 per cent.

Some plants have curtailed operations; others have sold out. (The industry now has about 95 firms.) But several companies specializing in commercial work are doing fairly well.

Excess capacity has caused price cutting, but some people believe it amounts to only 10 to 15 per cent.

Recouping — Two thing are being done to replace defense business:

1. Commercial contracts for intricate, close tolerance parts are being sought, particularly in electronics and appliances.

2. Technical developments are being pushed to broaden applications.

Bigger Castings Needed—John K. Dietz, a Chance Vought metallurgical engineer, said at an Investment Casting Institute meeting: At the present rate of aircraft and missile production, castings 36 to 48 in., with 0.1 in. minimum section, a 260,000-psi tensile strength, 210,000-psi yield strength, and a minimum of 4 per cent elongation would have a $125-million sales potential.

Present limits are 15 in., with a minimum section of 0.2 in, and a tensile strength of 150,000 psi.

"The sales potential would be even bigger," Mr. Dietz said, "if some of the larger fittings produced from forgings or heavy machinings could be cast."

Ceramic type molds are the most important new development. Their promise: Lower cost and larger, more intricate, higher quality castings.

Some parts, having extreme physical properties, are being made for aircraft and missiles by vacuum melting and vacuum casting.

New alloys, with superior physical properties, are also broadening markets.

Pig Iron . . .

Pig Iron Prices, Page 162

With many ferrous foundries closed for vacations, shipments of pig iron and coke are down substantially this month. Operations at those shops which are open are spotty because of low order backlogs which average only three or four days. Merchant pig iron sellers anticipate no marked improvement until after Labor Day.

Because of slack business in the automotive industry, National Mal-

leable & Steel Castings Co. has closed its Indianapolis plant for the first time since it opened in 1881. The management predicts the shutdown will last at least one year. Work usually done at that plant will be shifted to the firm's plants at Chicago and Cleveland.

Wisconsin Steel Div., International Harvester Co., blew out its No. 1 furnace at South Chicago, Ill., June 28, leaving only one of three active. In the Chicago district, only 22 of 43 blast furnaces are operating.

Freight rates have been reduced from Boston (Everett, Mass.) to several consuming points: Springfield, Holyoke, and Greenfield, Mass., to $4.79 per gross ton from $5.77; Amesbury, Mass., to $3.80 from $4.57; and Winchendon, Mass., to $4.30 from $5.17.

Iron Ore . . .

Iron Ore Prices, Page 163

The Chesapeake & Ohio Railway's ore handling facilities at Newport News, Va., recently set a one-day unloading record of 42,624 net tons from two ships.

The Liberian bulk carrier, *Rio Macareo*, discharged 38,325 net tons of Labrador ore destined for the Armco plant at Ashland, Ky. It was the largest single consignment ever received at the port. On the same day, the Japanese carrier, *Akikawa Maru*, delivered 4229 tons of manganese ore from Ghana, West Africa.

Wire . . .

Wire Prices, Pages 159 & 160

Most wire mills are resuming production this week following the early July suspension for mass vacations. July shipments will be light, for some mills probably the smallest monthly tonnage for the year.

August volume will be heavier. Orders for shipment that month are being booked. Merchant products, available from stock, are being shipped this month. A slight improvement in demand for nails is noted.

Sheets, Strip . . .

Sheet & Strip Prices, Pages 158 & 159

Sheet steel business is a shade better than had been expected. Except for automotive requirements, most consuming lines are buying a little, and delivery promises are slightly more extended than they were. Tonnage is readily available in most sheet categories.

Hot-rolled carbon shipments range two to three weeks, and cold-rolled carbon around four weeks. At least one large producer of galvanized sheets has nothing to offer before the last week of August. Deliveries on silicon sheets, stainless, and other specialties are steady.

Bookings, generally, are down from June's. In large measure, the situation is attributable to price hedging last month. Although prices haven't changed, there is little additional hedging. Consumers are not anxious to build stocks, though inventories are seriously depleted in some instances.

One feature of demand is that deliveries are specified for longer periods. For example, Granite City Steel Co.'s July order book is expected to equal June's, but deliveries are being spread out through July, August, and September.

SR . . . the dc rectifier type welder with new completely sealed semimetallic rectifier, new transformer and new weld stabilized circuit. Result is easiest arc starting ever; maximum arc stability; sounder, denser welds; current that handles all electrodes in all positions! Four models, 200 to 600 amps.
SRH . . . the same revolutionary improvements that set the Gold Star SR above and beyond the performance standards ever before achieved by a dc rectifier type welder. Designed primarily for compactness, the SRH is only 30¼" high — is ideally suited for stacking or paralleling in minimum space. Three models, 200 to 400 amps.
The miller GOLD STAR ALL STAR LINE
300 . . . combination ac dc welder design comes of age with this new Miller model. Features: new magnetic amplifier circuit; improved wave form; new arc starting control; three electrically controlled current ranges for finest adjustment; instant changeover from ac to dc; built-in high frequency. An entirely fresh concept for inert gas and metallic welding. Four basic models with kits available to convert to seven different types of welders.
300-M . . . an ac welder for inert gas and metallic arc processes. Combines unequalled welding characteristics with Miller's unique electric control circuit which permits precise slow or fast start. Features: built-in high frequency, primary contactor and ½ KVA control transformer. Offered in three basic models of from 200 to 400 amperes with optional water and gas controls available.
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miller ELECTRIC MANUFACTURING COMPANY, INC. Appleton, Wisconsin
Distributed in Canada by Canadian Liquid Air Co., Ltd., Montreal, P. Q.

Plates . . .

Plate Prices, Page 157

Although sheared plate bookings appear more numerous than they were a month ago, platemakers say tonnage is not as heavy, and deliveries are easier. Carbon plates are available within two weeks; silicon plates, three to four weeks; and alloy plates, four weeks.

Bookings over the remainder of the summer should be heavier as plate fabricators' operations become less adversely affected by vacation suspensions. Also, building and pipe requirements are expected to rise, and shipwork appears a little more promising. Heavy industrial equipment and railroad needs, though, show no signs of gaining.

Plate mill capacity of U. S. Steel's Tennessee Coal & Iron Div. at the Fairfield Works, Birmingham, will be increased 20 per cent by late 1959.

Reinforcing Bars . . .

Reinforcing Bar Prices Page 157

Welded highway mesh tonnage being estimated in eastern markets is the heaviest so far this year. Also, concrete reinforcing bar contracts are up in New England, with bridge and school tonnages leading demand. One Boston office building is taking close to 1000 tons of bars.

Orders are more widely spread among distributors and fabricators than they were. More sellers are competitive, and there is some price shading.

Steel Bars . . .

Bar Prices, Page 157

Some spotty improvement in steel bar demand is reported, notably in the Midwest, but, over-all, a sluggish market situation continues.

Indications are there won't be much change until September, barring unexpected developments in industry stemming from military intervention in the Middle East.

Buying is said to be at the slowest pace of the year. Vacation suspensions are reflected to some extent, but price-hedge buying in June also is a factor. There is little hedge buying currently, consumers, for the most part, covering only immediate needs with prompt mill shipments available.

Barmakers anticipate better demand will begin developing next month, especially if automotive requirements turn sharply upward.

Great Lakes Steel Corp. plans to put its 15-in. mill into production next month if it can get enough business to support operations. Meanwhile, other producers reaching into the Detroit automotive market from outside are absorbing $2 a ton more freight to remain competitive with Great Lakes Steel's 10-in. bar prices.

Tubular Goods . . .

Tubular Goods Prices, Page 161

Indications are July tubular goods volume will be off from that reported in June. Bookings last month, to some extent, were due to hedging against an anticipated price increase that didn't come July 1.

Building and other construction work is providing a fairly strong demand for standard pipe, but makers of oil country goods and line pipe are entertaining little new volume. Large diameter pipe volume, though, has picked up.

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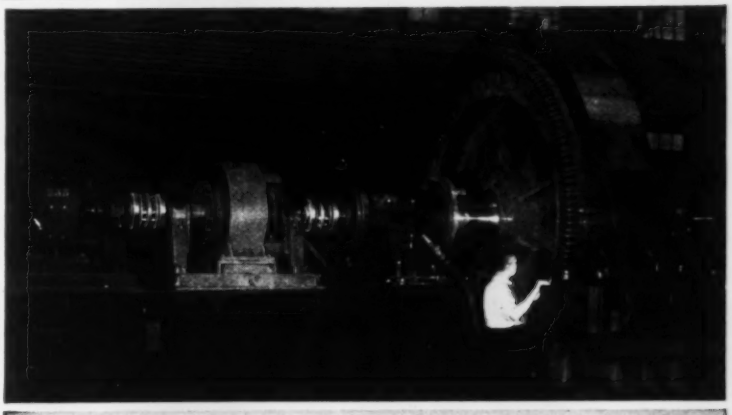

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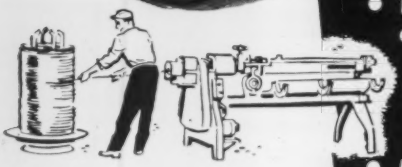

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El Paso Natural Gas Co. plans a gas pipeline from the Aneth field area of Utah, Colorado, New Mexico, and Arizona. It will cost $26 millions, and include 13-miles of 20-in. line, 62 miles of 16-in. line, and 102 miles of various dimensions.

Tin Plate . . .

Tin Plate Prices, Page 159

May shipments of metal cans totaled 364,608 tons, vs. 319,748 in April and 399,323 in May last year, reports the Census Bureau. The total for the first five months of this year was 1,665,710 tons, vs. 1,756,430 shipped in the like period last year.

Ferroalloys . . .

Ferroalloy Prices, Page 164

A ferromanganese-silicon alloy has been introduced by Electro Metallurgical Co., a division of Union Carbide Corp., New York. It is used as a slag reducing agent and a source of low-carbon manganese.

Many melters are using it for slag reduction in place of ferrochrome-silicon, particularly in the production of 200-series stainless steel. Substantial cost savings are claimed in meeting high-manganese specifications.

The price of $110 per gross ton, Mt. Pleasant and Siglo, Tenn., on ferrophosphorus, appearing on Page 172 of the July 14 issue was in error. The correct price is $120 per gross ton, carload, bulk, f.o.b. sellers' works, Mt. Pleasant and Siglo, Tenn. Also, the unitage for each per cent phosphorus, above or below the base, is $5, not $4.

Fasteners . . .

Bolt, Nut, Rivet Prices, Page 160

Competition for going business is keen in the industrial fastener market, but order volume appears to be slightly better, and makers are expecting a steady pickup in buying the rest of the year. Automotive inquiry is beginning to come in but not much business is expected on auto account until September.

While published discounts are unchanged, there has been considerable price cutting in this market recently. In highly competitive situations, some sellers have departed

from the published discounts, quoting net prices per 100 pieces on case quantities, 30 case quantities, 20,000-lb and 40,000-lb lots.

Producers claim they should advance prices to offset higher wage costs, but no formal price action is anticipated until the situation with respect to steel prices is clarified.

Service Centers Busier

A slight, steady increase in May and June shipments is reported by the nation's steel service centers. But surveys by the American Steel Warehouse Association indicate the situation varies by geographic region.

June reports show that Chicago and other areas heavily dependent on agriculture reported substantial increases in steel shipments. Areas tied to automotive and capital goods have had only modest gains. Plant shutdowns for vacations will exert a depressing influence during July and August.

Areas reporting improved shipments in June included: Chicago, the Twin Cities, Nebraska, Iowa, Kansas, Missouri, Oklahoma, and Texas. The South also reported improvement during the month, but reports from the West Coast indicate local factors are holding back a stepup in business.

Robert G. Welch, executive vice president of the association, said three factors influencing better volume in May and June were: Construction activity, government contracts, and low inventories of manufacturers. He said demand for structurals, stainless, and many types of flat-rolled products has picked up.

Stocks of industrial steel products held by the steel service centers total an estimated 3,700,000 net tons. Not much change is anticipated over coming months.

Industry leaders say steel service center sales started to decline in the spring of 1957, but the contraction has been uneven, having much greater impact in the Great Lakes and Atlantic Seaboard regions than in the South and West.

Distributors . . .

Prices, Page 162

Activity at steel service centers is expected to hit the low point of the year this month. Distributors expect an upturn next month and a more appreciable gain after

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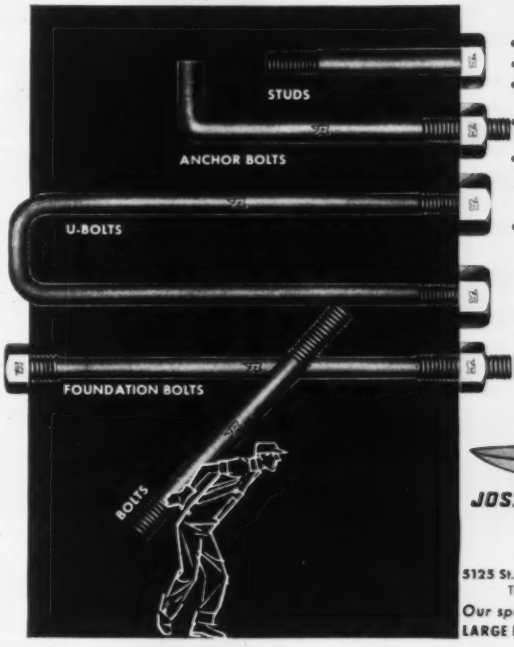

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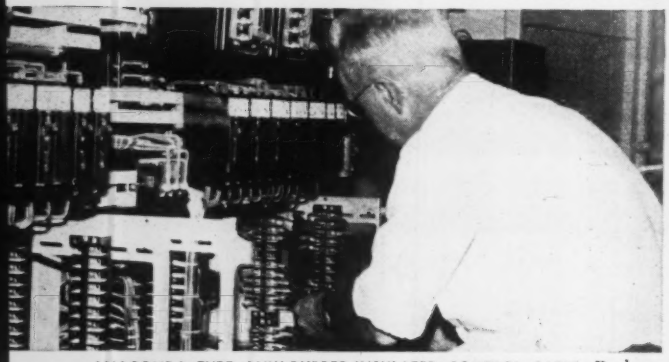

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DENSHEATH*-Insulated 600-Volts	Thermoplastic cable. Excellent moisture and chemical resistance. Long-aging.		
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Labor Day holiday and vacations.

June bookings were up 8 to 10 per cent over those recorded in May with bars among the better moving products. Sustained demand from agricultural implement manufacturers in the Chicago district has been the chief support of the bar market in that section of the country; general usage appears stronger in all districts.

Prices remain highly competitive and in some districts, especially the Southwest—published schedules serve only as rough guides to the market.

U. S. Steel Supply Div., U. S. Steel Corp., has installed 68 infrared heaters in its Portland, Oreg., warehouse for added protection against corrosion of products. Humidity is carefully regulated, eliminating rust-causing moisture.

Structural Shapes . . .

Structural Shape Prices, Page 157

While structural steel contracts are comparatively light, considerable tonnage is being figured, particularly bridgework. Other public work, such as schools, is contributing substantially to market activity. There also is a fair amount of commercial construction before the market. Industrial building continues to lag.

Competition among fabricating shops is keen, particularly among the small fabricators who are not in position to figure on much bridge tonnage.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

3200 tons, office building, Diesel Construction Co., 30 West Broadway, New York, to Dreier Structural Steel Co. Inc., Long Island City, N. Y.

1000 tons, three state bridges, Huntington Expressway, Providence-Cranston, R. I., to Tower Iron Works, Providence; M. A. Gammino Construction Co., Providence, general contractor.

300 tons, Nike installation, Alaska, to United Iron Works Inc., Seattle.

150 tons, remodeling at Boeing plant, and shop project, Ft. Lewis, to United Iron Works Inc., Seattle.

90 tons, replacement, spillway bridge, Rocky Reach Dam, Wenatchee, Wash., to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

640 tons, Public School No. 299, Brooklyn, Caristo Contracting Co., low on the general contract.

635 tons, Public School No. 298, Brooklyn, N. Y.; bids July 23.

650 tons, Students' Center, Manhattan College, New York; bids asked.

400 tons, dairy, Portland, Oreg.; bids in.

220 tons, also 140 tons of reinforcing, Washington State highway bridge, Whatcom County; general contract to Wilder Construction Co., Bellingham, Wash., low at $535,322.

Iron Ore Statistics—May, 1958

(Gross tons)

Stocks at	U. S. Ores L. Superior	U. S. Ores Other	Canadian L. Superior	Canadian Other	Foreign Ores	Totals
U. S. Furnaces:						
Eastern	3,454,326	194,190	156,256	1,430,865	4,003,939	9,239,576
Pitts-Youngstown	7,397,146	55,341	445,500	1,625,670	3,366,322	12,889,979
Cleve.-Detroit	7,657,557	139,333	126,191	269,515	352,799	8,545,395
Chicago	8,149,377	(a)	(a)	.....	(a)	8,149,377
Southern	(a)	2,320,757	.....	(a)	1,498,446	3,819,203
Western	.....	737,969	.....	.....	.....	737,969
Total	26,658,406	3,447,590	727,947	3,326,050	9,221,506	43,381,499
At U. S. Docks:						
Lake Erie	3,369,509	.....	113,505	972,294	.....	4,455,308
Other	.....	.....	.....	(a)	(a)	(a)
Total	3,369,509	.....	113,505	972,294	(a)	4,455,308
Total U. S. Stocks	30,027,915	3,447,590	841,452	4,298,344	9,221,506	47,836,807
Total U. S.-Canada	31,140,909	3,447,590	870,932	4,694,425	9,342,730	49,496,586

CONSUMPTION OF IRON ORE—MAY, 1958

(Gross tons)

In U. S. Districts:	U. S. Ores L. Superior	U. S. Ores Other	Canadian L. Superior	Canadian Other	Foreign Ores	Totals
Eastern	325,241	125,419	56,616	254,071	620,546	1,381,893
Pitts-Youngstown	1,215,625	109,040	70,843	270,989	305,126	1,971,623
Cleve.-Detroit	489,408	25,463	57,054	9,603	31,462	612,990
Chicago	1,186,346	(a)	(a)	.....	(a)	1,186,346
Southern	(a)	410,181	.....	(a)	152,495	562,676
Western	.....	501,292	.....	.....	.....	501,292
In U. S.						
Blast furnaces	2,685,121	879,420	151,596	322,979	426,296	4,465,412
Steel furnaces	111,710	55,922	422	13,959	288,583	470,626
Sintering (1)	406,231	236,044	32,495	197,725	394,750	1,267,245
Miscellaneous (2)	13,528	9	.....	.....	.....	13,537
Total in U. S.	3,216,620	1,171,395	184,513	534,663	1,109,629	6,216,820
In Canada						
Blast furnaces	218,194	.....	49,952	55,352	.....	323,498
Steel furnaces	16,754	.....	.....	6,549	11,360	34,663
Sintering (1)	60,737	.....	.....	18,970	332	80,039
Miscellaneous (2)	.....	.....	.....	.....	.....	.....
Total U. S.-Canada	3,512,305	1,171,395	234,465	615,534	1,121,321	6,655,020

(1) Consumed in sintering plants not located at mine sites.
(2) Sold to nonreporting companies or used for purposes not listed.
(a) Small tonnage included in other districts to avoid disclosure.
Data from the American Iron Ore Association and the American Iron & Steel Institute.

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60% less push

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	Vertical Force Required	Horizontal Force Required
Wheelbarrow "A"	125 lbs.	22 lbs.
Wheelbarrow "B"	128 lbs.	20 lbs.
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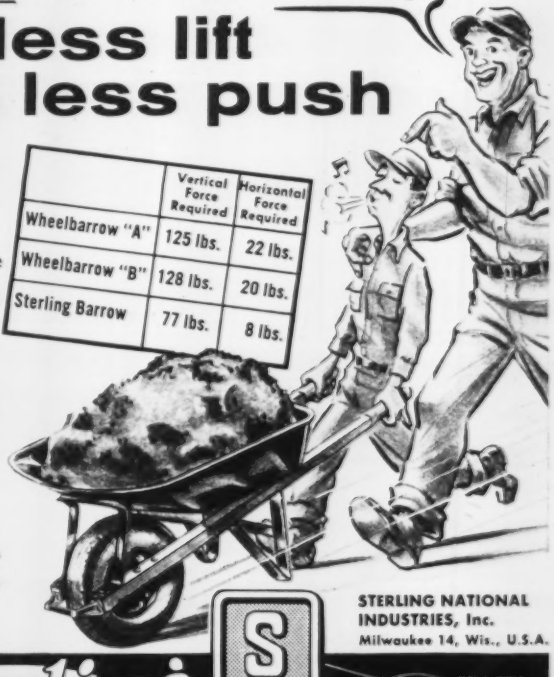

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REINFORCING BARS . . .

REINFORCING BARS PLACED

1000 tons, postal annex building, Denver, to the Colorado Builders Supply Co., Denver; C. H. Leavell & Co., El Paso, Tex., general contractor; 2000 tons of fabricated structural steel to the Burkhardt Steel Co., Denver.

900 tons, Blue Cross Building, Federal Street, Boston, to U. S. Steel Supply Div., U. S. Steel Corp., Boston; George A. Fuller Co., Boston, general contractor.

870 tons, state highway structures, Huntington Expressway, Providence-Cranston, R. I., to Plantations Steel Co., Providence; M. A. Gammino Construction Co., Providence, general contractor.

475 tons, hospital building, Oak Ridge, Tenn., to Callaway Building Products Co., Knoxville, Tenn.; Foster & Creighton Co., Nashville, Tenn., general contractor.

300 tons, including structurals, buildings, medium security prison, Enfield, Conn., to Scherer Steel Co., Hartford, Conn. (reinforcing), and Kilpatrick Iron Works (structurals); Felix Buzzi & Son Inc., Torrington, Conn., general contractor.

REINFORCING BARS PENDING

8000 tons, powerhouse, etc., Ice Harbor Dam, Snake River; also unstated tonnage of shapes for roof system and miscellaneous; bids invited July 25 for opening Sept. 18; U. S. Engineer, Walla Walla, Wash.

540 tons, Sec. 5, South Charles relief sewer, Boston-Brookline, Mass.; bids to the Massachusetts District Commission, Boston; also, 75 tons of steel sheet piling.

200 tons, Washington State, two highway spans, Okanogan County; bids to Olympia, Wash., July 29.

175 tons, four highway overpasses, Toole and Mineral Counties, Montana; bids to Helena, Mont., July 22 and 23.

150 tons, five highway bridges, Montana, Granite and Powell Counties; bids to Helena, Mont., July 22.

100 tons, Washington State, highway span, Cowlitz County; bids to Olympia, Wash., July 29.

100 tons or more, Idaho, Payette River Bridge; general contract to J. O. Young & Sons, Nampa, Idaho, low at $143,989.

100 tons or more, Idaho, three passes, Bannock County; general contract to Cherf Bros. & Sandkay Contractors Inc., Ephrata, Wash., low at $989,883.

75 tons, also unstated structurals for gates and equipment, Little Wood River Dam, near Carey, Idaho; Lewis Hopkins Co. and A. R. Sime, Pasco, Wash., joint low at $1,093,945 to the Bureau of Reclamation, Rupert, Idaho.

June Steel Output Rises

June production of ingots and steel for castings was the highest for any month so far this year. At 7,132,000 net tons, output compared with 6,301,159 in May and 9,391,402 in June a year ago.

Operations averaged 61.7 per cent, and the American Iron & Steel Institute's index (1947-49 average base) stood at 103.6, against 88.6 in May and 136.4 in June, 1957.

Second quarter output at 18,996,150 tons was about 175,000 tons greater than the 18,790,857 produced in the first quarter but was down a little more than 10 million tons from the 28,998,505 produced in the second quarter last year.

The operating rate in the second quarter averaged 54.1 per cent, vs. 54.1 in the first quarter and 87.2 in the second quarter, 1957.

During the first six months of this year, the steelmaking furnaces poured 37,757,007 tons, vs. 60,583,547 in the comparable period of 1957 and 52,131,449 in the second half of last year.

The ingot rate in the first half averaged 54.1 per cent, vs. 91.5 a year ago.

Steel Ingot Production—June, 1958

	OPEN HEARTH		BESSEMER		ELECTRIC		TOTAL	
Period	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity	Net tons	Per cent of capacity
1958								
January	6,085,124	58.6	121,338	35.5	547,440	44.8	6,753,902	56.5
February	5,252,112	56.0	81,597	26.4	448,614	40.6	5,782,323	53.6
March	5,598,944	53.9	122,317	35.8	533,361	43.6	6,254,622	52.3
1st Qtr.	16,936,180	56.2	325,252	32.8	1,529,425	43.1	18,790,857	54.1
April	4,875,619	48.5	109,433	33.1	547,939	46.3	5,532,991	47.8
May	5,602,123	53.9	110,366	32.3	588,670	48.2	6,301,159	52.7
June	6,382,000	63.5	88,000	26.6	662,000	56.0	7,132,000	61.7
2nd Qtr.	16,859,742	55.3	307,799	30.7	1,798,609	50.1	18,966,150	54.1
1st 6 Mo.	33,795,922	55.7	633,051	31.7	3,328,034	46.6	37,757,007	54.1
1957								
January	9,829,691	99.0	294,839	77.1	884,232	86.5	11,008,762	97.1
February	8,898,671	99.2	227,682	80.4	810,853	87.8	9,987,206	97.6
March	9,442,164	95.1	275,156	71.9	871,754	85.2	10,589,074	93.4
1st Qtr.	28,170,526	97.7	847,677	76.3	2,566,839	86.4	31,585,042	96.0
April	8,820,328	91.8	231,731	62.6	762,721	77.1	9,814,780	89.5
May	8,842,707	89.1	201,864	52.8	747,752	73.1	9,792,323	86.4
June	8,498,903	88.4	210,915	57.0	681,584	68.9	9,391,402	85.6
2nd Qtr.	26,161,938	89.8	644,510	57.4	2,192,057	73.0	28,998,505	87.2
1st 6 Mo.	54,332,464	93.7	1,492,187	66.8	4,758,896	79.7	60,583,547	91.5
July	8,086,519	81.4	194,638	50.9	627,575	61.4	8,908,732	78.6
August	8,297,172	83.6	204,723	53.5	731,995	71.6	9,233,890	81.5
September	8,135,139	84.7	185,967	50.2	656,800	66.4	8,977,906	81.8
3rd Qtr.	24,518,830	83.2	585,328	51.5	2,016,370	66.4	27,120,528	80.6
9 Mo.	78,851,294	90.2	2,077,515	61.7	6,775,266	75.2	87,704,075	87.9
October	8,348,522	84.1	154,577	40.4	694,618	67.9	9,197,717	81.1
November	7,674,698	79.9	134,709	36.4	583,512	59.0	8,392,919	76.5
December	6,783,262	68.3	108,237	28.3	528,686	51.7	7,420,285	65.5
4th Qtr.	22,806,482	77.4	397,623	35.0	1,806,816	59.5	25,010,921	74.4
2nd 6 Mo.	47,325,312	80.3	982,951	43.3	3,823,186	63.0	52,131,449	77.5
Total	101,657,776	87.0	2,475,138	54.9	8,582,082	71.3	112,714,996	84.5

Note: The percentages of capacity operated are based on annual capacities as of Jan. 1, 1958, as follows: Open hearth 122,321,830 net tons; bessemer 4,027,000 net tons; oxygen process, electric and crucible 14,398,740 net tons. Total for 1958, 140,742,570 net tons. For 1957, the capacity tonnages are: Open hearth 116,912,410 net tons; bessemer 4,505,000 net tons; oxygen process, electric and crucible 12,041,740 net tons. Total for 1957, 133,459,150 net tons.

(r) Revised. (p) Preliminary.

DISTRICT INGOT RATES

(Percentage of Capacity Engaged)

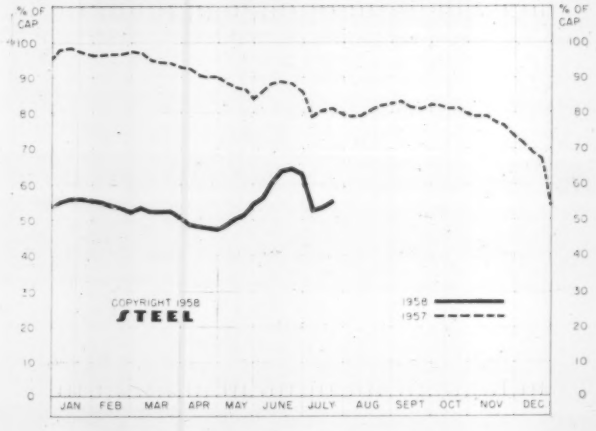
	Week Ended July 20	Change	Same Week 1957	Same Week 1955
Pittsburgh	48	0	83.5	2.5
Chicago	62	+ 0.5	84	6
Mid-Atalantic	63	+ 2	90	11
Youngstown	19	+ 7	79	5
Wheeling	73.5	+ 2	77	53.5
Cleveland	48.5	+ 11	78	9
Buffalo	14	+ 5	88	0
Birmingham	53.5	+ 3	91.5	3.5
New England	30	0	50	38
Cincinnati	44	+ 23.5*	62	69.5
St. Louis	92.5	+ 6	84.5	84
Detroit	58.5	+ 1	86.5	43.5
Western	67	0*	99	30
National Rate	55.5	+ 2	81	14.5

INGOT PRODUCTION‡

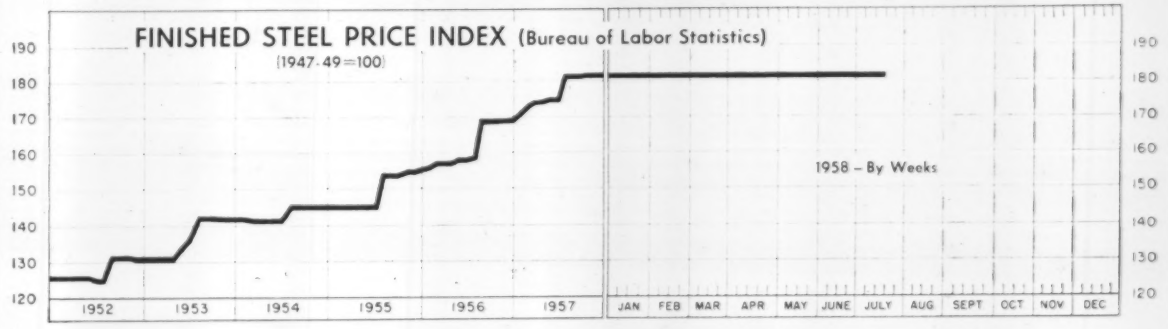
	Week Ended July 20	Week Ago	Month Ago	Year Ago
INDEX (1947-49=100)	94.3†	89.8	109.0	126.4
NET TONS (In thousands)	1,515†	1,442	1,751	2,030

*Change from preceding week's revised rate. †Estimated. ‡American Iron & Steel Institute. Weekly capacity (net tons): 2,699,173 in 1958; 2,559,490 in 1957; 2,461,893 in 1956.

NATIONAL STEELWORKS OPERATIONS



Price Indexes and Composites



July 15, 1958	Week Ago	Month Ago	June Avg	Year Ago
181.5	181.5	181.5	181.5	181.5

AVERAGE PRICES OF STEEL (Bureau of Labor Statistics)

Week Ended July 15

Prices include mill base prices and typical extras and deductions. Units are 100 lb except where otherwise noted in parentheses. For complete description of the following products and extras and deductions applicable to them, write to STEEL.

Rails, Standard No. 1	$5.600
Rails, Light, 40 lb	7.067
Tie Plates	6.600
Axles, Railway	9.825
Wheels, Freight Car, 33 in. (per wheel)	60.000
Plates, Carbon	6.150
Structural Shapes	5.942
Bars, Tool Steel, Carbon (lb)	0.535
Bars, Tool Steel, Alloy, Oil Hardening Die (lb)	0.650
Bars, Tool Steel, H.R., Alloy, High Speed, W 6.75, Cr 4.5, V 2.1, Mo 5.5, C 0.60 (lb)	1.355
Bars, Tool Steel, H.R., Alloy, High Speed, W18, Cr 4, V 1 (lb)	1.850
Bars, H.R., Alloy	10.525
Bars, H.R., Stainless, 303 (lb)	0.525
Bars, H.R., Carbon	6.425
Bars, Reinforcing	6.135
Bars, C.F., Carbon	10.360
Bars, C.F., Alloy	13.875
Bars, C.F., Stainless, 302 (lb)	0.553
Sheets, H.R., Carbon	6.175
Sheets, C.R., Carbon	7.075
Sheets, Galvanized	8.270
Sheets, C.R., Stainless, 302 (lb)	0.688
Sheets, Electrical	12.025
Strip, C.R., Carbon	9.214
Strip, C.R., Stainless, 430 (lb)	0.493
Strip, H.R., Carbon	6.075
Pipe, Black, Buttweld (100 ft)	19.814
Pipe, Galv., Buttweld (100 ft)	23.264
Pipe, Line (100 ft)	199.023
Casing, Oil Well, Carbon (100 ft)	194.499
Casing, Oil Well, Alloy (100 ft)	304.610
Tubes, Boiler (100 ft)	49.130
Tubing, Mechanical, Carbon (100 ft)	24.953
Tubing, Mechanical, Stainless, 304 (100 ft)	205.608
Tin Plate, Hot-dipped, 1.25 lb (95 lb base box)	9.783
Tin Plate, Electrolytic, 0.25 lb (95 lb base box)	8.483
Black Plate, Canmaking Quality (95 lb base box)	7.583
Wire, Drawn, Carbon	10.225
Wire, Drawn, Stainless, 430 (lb)	0.653
Bale Ties (bundles)	7.967
Nails, Wire, 8d Common	9.828
Wire, Barbed (80-rod spool)	8.719
Woven Wire Fence (20-rod roll)	21.737

STEEL's FINISHED STEEL PRICE INDEX*

	July 16 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Index (1935-39 avg=100)	239.15	239.15	239.15	239.15	189.33
Index in cents per lb	6.479	6.479	6.479	6.479	5.129

STEEL's ARITHMETICAL PRICE COMPOSITES*

Finished Steel, NT	$145.42	$145.42	$145.42	$146.19	$114.84
No. 2 Fdry Pig Iron, GT	66.49	66.49	66.49	66.27	56.54
Basic Pig Iron, GT	65.99	65.99	65.99	65.68	56.04
Malleable Pig Iron, GT	67.27	67.27	67.27	67.06	57.27
Steelmaking Scrap, GT	36.67	35.83†	35.00	54.33	43.42

*For explanation of weighted index see STEEL, Sept. 19, 1949, p. 54; of arithmetical price composite, STEEL, Sept. 1, 1952, p. 130. †Revised.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED STEEL	July 16 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bars, H.R., Pittsburgh	5.425	5.425	5.425	5.425	4.15
Bars, H.R., Chicago	5.425	5.425	5.425	5.425	4.15
Bars, H.R., deld. Philadelphia	5.725	5.725	5.725	5.715	5.302
Bars, C.F., Pittsburgh	7.30*	7.30*	7.30*	7.30*	5.20
Shapes, Std., Pittsburgh	5.275	5.275	5.275	5.275	4.10
Shapes, Std., Chicago	5.275	5.275	5.275	5.275	4.10
Shapes, deld., Philadelphia	5.545	5.545	5.545	5.585	4.38
Plates, Pittsburgh	5.10	5.10	5.10	5.10	4.10
Plates, Chicago	5.10	5.10	5.10	5.10	4.10
Plates, Coatesville, Pa.	5.10	5.10	5.10	5.50	4.35
Plates, Sparrows Point, Md.	5.10	5.10	5.10	5.10	4.10
Plates, Claymont, Del.	5.10	5.10	5.10	5.70	4.55
Sheets, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.925
Sheets, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Sheets, C.R., Pittsburgh	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Chicago	6.05	6.05	6.05	6.05	4.775
Sheets, C.R., Detroit	6.05	6.05	6.05	6.05-6.15	4.975
Sheets, Galv., Pittsburgh	6.60	6.60	6.60	6.60	5.275
Strip, H.R., Pittsburgh	4.925	4.925	4.925	4.925	3.975-4.425
Strip, H.R., Chicago	4.925	4.925	4.925	4.925	3.925
Strip, C.R., Pittsburgh	7.15	7.15	7.15	7.15	5.45-5.95
Strip, C.R., Chicago	7.15	7.15	7.15	7.15	5.70
Strip, C.R., Detroit	7.15	7.15	7.15	7.25	5.45-6.05
Wire, Basic, Pittsburgh	7.65	7.65	7.65	7.65	5.475-5.525
Nails, Wire, Pittsburgh	8.95	8.95	8.95	8.95	6.35-6.55
Tin plate (1.50 lb) box, Pitts.	$10.30	$10.30	$10.30	$10.30	$8.95

*Including 0.35c for special quality.

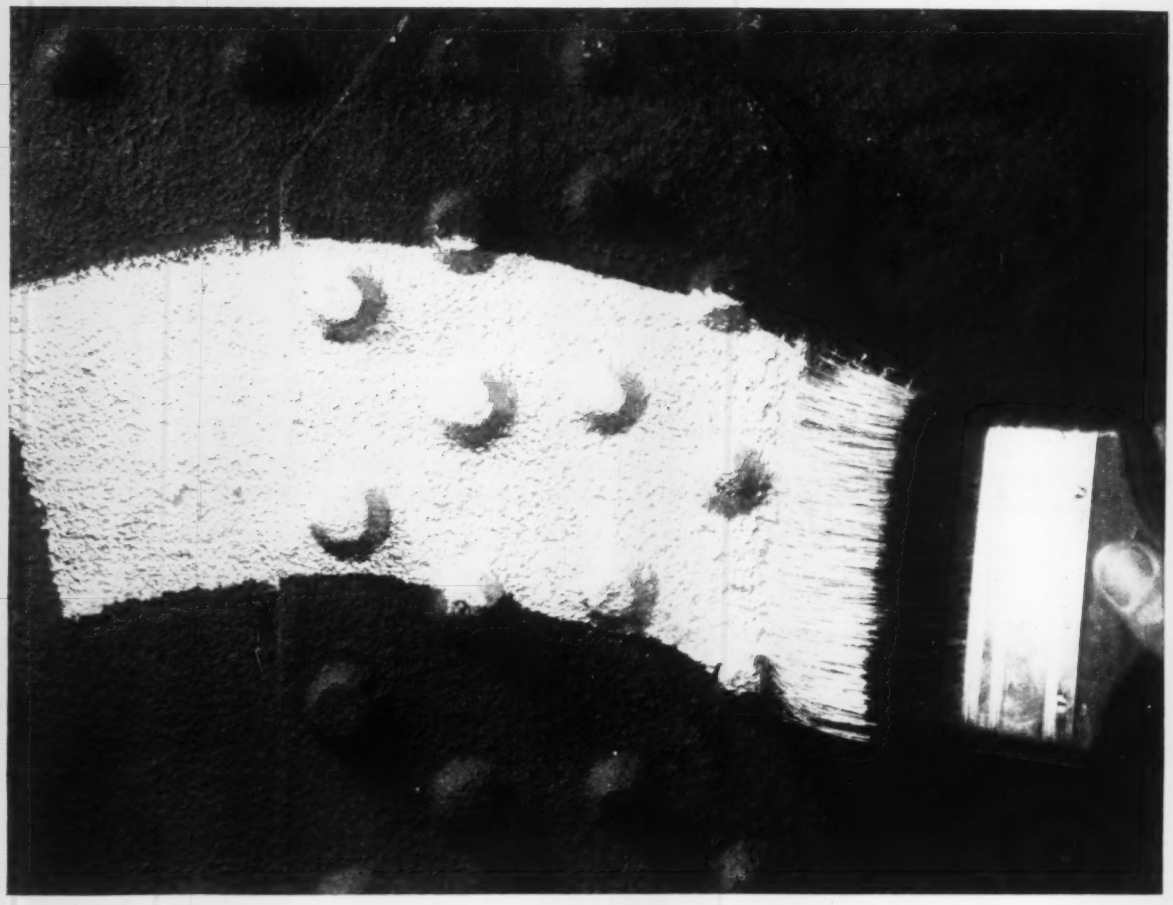
SEMIFINISHED STEEL					
Billets, forging, Pitts. (NT)	$96.00	$96.00	$96.00	$96.00	$75.50
Wire rods 7/32-9/32" Pitts.	6.15	6.15	6.15	6.15	4.525

PIG IRON, Gross Ton	July 16 1958	Week Ago	Month Ago	Year Ago	5 Yr Ago
Bessemer, Pitts.	$67.00	$67.00	$67.00	$67.00	$57.00
Basic, Valley	66.00	66.00	66.00	64.50	56.00
Basic, deld., Phila.	70.41	70.41	70.41	69.88	60.75
No. 2 Fdry, Neville Island, Pa.	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, Chicago	66.50	66.50	66.50	66.50	56.50
No. 2 Fdry, deld., Phila.	70.91	70.91	70.91	70.38	61.25
No. 2 Fdry, Birm.	62.50	62.50	62.50	62.50	52.88
No. 2 Fdry (Birm.) deld. Cin	70.20	70.20	70.20	70.20	60.43
Malleable, Valley	66.50	66.50	66.50	65.00	56.50
Malleable, Chicago	66.50	66.50	66.50	66.50	56.50
Ferromanganese, net ton	245.00†	245.00†	245.00†	255.00†	200.00*

74-76% Mn, Duquesne, Pa. *Etna, Pa.

SCRAP, Gross Ton (Including broker's commission)					
No. 1 Heavy Melt, Pittsburgh	$35.50	$35.50	$35.50	$55.50	$44.50
No. 1 Heavy Melt, E. Pa.	35.00	34.00	34.00	54.50	44.25
No. 1 Heavy Melt, Chicago	39.50	38.00	35.50	53.00	41.50
No. 1 Heavy Melt, Valley	38.50	38.50	36.50	54.50	45.50
No. 1 Heavy Melt, Cleve.	35.00	35.00	33.00	51.50	44.50
No. 1 Heavy Melt, Buffalo	27.50	27.50	26.50	46.50	44.75
Rails, Rerolling, Chicago	57.50	55.50	52.50	76.50	54.50
No. 1 Cast, Chicago	41.50	41.50	41.50	47.50	41.00

COKE, Net Ton					
Beehive, Furn., Connlsvl.	$15.25	$15.25	$15.25	$15.25	$14.75
Beehive, Fdry., Connlsvl.	18.25	18.25	18.25	18.25	16.75



NEW GULF METALCOAT A protects against rust up to 10 times longer

Now you've got a stronger ally than ever, in the war against rust and corrosion. New Gulf Metalcoat A . . . the revolutionary new aluminum pigmented liquid coating . . . protects metal surfaces up to 10 times longer—under the most severe exposures in industrial and marine atmospheres.

Salt spray tests at Wrightsville Beach, N. C. proved that new Gulf Metalcoat A gives 7 to 10 times greater protection than competitive products. And before its introduction, nine years of intensive exposure tests proved its extraordinary rust preventive properties.

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GULF OIL CORPORATION
Dept. DM, Gulf Building
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GULF ®

Steel Prices

Mill prices as reported to STEEL, July 16, cents per pound except as otherwise noted. *Changes shown in italics.* Code number following mill points indicate producting company. Key to producers, page 158; footnotes, page 160.

SEMIFINISHED

INGOTS, Carbon, Forging (NT)
Munhall,Pa. U5 ....$73.50

INGOTS, Alloy (NT)
Detroit S41 ....$77.00
Farrell,Pa. S3 ....77.00
Lowellville,O. S3 ....77.00
Midland,Pa. C18 ....77.00
Munhall,Pa. U5 ....77.00
Sharon,Pa. S3 ....77.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$77.50
Buffalo R2 ....77.50
Clairton,Pa. U5 ....77.50
Ensley,Ala. T2 ....77.50
Fairfield,Ala. T2 ....77.50
Fontana,Calif. K1 ....88.00
Gary,Ind. U5 ....77.50
Johnstown,Pa. B3 ....77.50
Lackawanna,N.Y. B2 ....77.50
Munhall,Pa. U5 ....77.50
Owensboro,Ky. G8 ....77.50
S.Chicago,Ill. R2, U5 ....77.50
S.Duquesne,Pa. U5 ....77.50
Sterling,Ill. N15 ....77.50
Youngstown R2 ....77.50

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$96.00
Buffalo R2 ....96.00
Canton,O. R2 ....98.50
Clairton,Pa. U5 ....96.00
Conshohocken,Pa. A3 ....101.00
Ensley,Ala. T2 ....96.00
Fairfield,Ala. T2 ....96.00
Fontana,Calif. K1 ....105.50
Gary,Ind. U5 ....96.00
Geneva,Utah C11 ....96.00
Houston S5 ....101.00
Johnstown,Pa. B2 ....96.00
Lackawanna,N.Y. B2 ....96.00
LosAngeles B3 ....105.50
Midland,Pa. C18 ....96.00
Munhall,Pa. U5 ....96.00
Owensboro,Ky. G8 ....96.00
Seattle B3 ....109.50
Sharon,Pa. S3 ....96.00
S.Chicago R2, U5, W14 ....96.00
S.Duquesne,Pa. U5 ....96.00
S.SanFrancisco B3 ....105.50
Warren,O. C17 ....96.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$114.00
Bridgeport,Conn. C32 ....114.00
Buffalo R2 ....114.00
Canton,O. R2, T7 ....114.00
Conshohocken,Pa. A3 ....121.00
Detroit S41 ....114.00
Economy,Pa. B14 ....114.00
Farrell,Pa. S3 ....114.00
Fontana,Calif. K1 ....135.00
Gary,Ind. U5 ....114.00
Houston S5 ....119.00
Ind.Harbor,Ind. Y1 ....114.00
Johnstown,Pa. B2 ....114.00
Lackawanna,N.Y. B2 ....114.00
LosAngeles B3 ....134.00
Lowellville,O. S3 ....114.00
Massillon,O. R2 ....114.00
Midland,Pa. C18 ....114.00
Munhall,Pa. U5 ....114.00
Owensboro,Ky. G8 ....114.00
Sharon,Pa. S3 ....114.00
S.Chicago R2,U5,W14 ....114.00
S.Duquesne,Pa. U5 ....114.00
Struthers,O. Y1 ....114.00
Warren,O. C17 ....114.00

ROUNDS, SEAMLESS TUBE (NT)
Buffalo R2 ....$117.50
Canton,O. R2 ....120.00
Cleveland R2 ....117.50
Gary,Ind. U5 ....117.50
S.Chicago,Ill. R2, W14 117.50
S.Duquesne,Pa. U5 ....117.50
Warren,O. C17 ....117.50

SKELP
Aliquippa,Pa. J5 ....5.075
Munhall,Pa. U5 ....4.875
Pittsburgh J5 ....5.075
Warren,O. R2 ....4.875
Youngstown R2, U5 ....4.875

WIRE RODS
AlabamaCity,Ala. R2 ....6.15
Aliquippa,Pa. J5 ....6.15
Alton,Ill. L1 ....6.35
Buffalo W12 ....6.15
Cleveland A7 ....6.15
Donora,Pa. A7 ....6.15
Fairfield,Ala. T2 ....6.15
Houston S5 ....6.40
IndianaHarbor,Ind. Y1 ....6.15
Johnstown,Pa. B2 ....6.15
Joliet,Ill. A7 ....6.15
KansasCity,Mo. S5 ....6.40
Kokomo,Ind. C16 ....6.25
LosAngeles B3 ....6.95
Minnequa,Colo. C10 ....6.40
Monessen,Pa. P7 ....6.15
N.Tonawanda,N.Y. B11 ....6.15
Pittsburg,Calif. C11 ....6.95
Portsmouth,O. P12 ....6.15
Roebling,N.J. R5 ....6.25
S.Chicago,Ill. R2 ....6.15
SparrowsPoint,Md. B2 ....6.25
Sterling,Ill. (1) N15 ....6.15
Sterling,Ill. N15 ....6.25
Struthers,O. Y1 ....6.15
Worcester,Mass. A7 ....6.45

STRUCTURALS

Carbon Steel Std. Shapes
AlabamaCity,Ala. R2 ..5.275
Atlanta A11 ....5.475
Aliquippa,Pa. J5 ....5.275
Bessemer,Ala. T2 ....5.275
Bethlehem,Pa. B2 ....5.325
Birmingham C15 ....5.275
Clairton,Pa. U5 ....5.275
Fairfield,Ala. T2 ....5.275
Fontana,Calif. K1 ....6.075
Gary,Ind. U5 ....5.275
Geneva,Utah C11 ....5.275
Houston S5 ....5.375
Ind.Harbor,Ind. I-2 ....5.275
Johnstown,Pa. B2 ....5.325
Joliet,Ill. P22 ....5.275
KansasCity,Mo. S5 ....5.375
Lackawanna,N.Y. B2 ..5.325
LosAngeles B3 ....5.975
Minnequa,Colo. C10 ....5.575
Munhall,Pa. U5 ....5.275
Niles,Calif. P1 ....5.925
Phoenixville,Pa. P4 ....5.325
Portland,Oreg. O4 ....6.025
Seattle B3 ....6.025
S.Chicago,Ill. U5, W14 5.275
S.SanFrancisco B3 ....5.925
Sterling,Ill. N15 ....5.275
Torrance,Calif. C11 ....5.975
Weirton,W.Va. W6 ....5.275

Wide Flange
Bethlehem,Pa. B2 ....5.325
Clairton,Pa. U5 ....5.275
Fontana,Calif. K1 ....6.225
IndianaHarbor,Ind. I-2 5.275
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
Phoenixville,Pa. P4 ....5.325
S.Chicago,Ill. U5 ....5.275
Weirton,W.Va. W6 ....5.275

Alloy Std. Shapes
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.65
KansasCity,Mo. S5 ....6.65
Munhall,Pa. U5 ....6.55
S.Chicago,Ill. U5 ....6.55

H.S., L.A. Std. Shapes
Aliquippa,Pa. J5 ....7.75
Bessemer,Ala. T2 ....7.75
Bethlehem,Pa. B2 ....7.80
Clairton,Pa. U5 ....7.75
Fairfield,Ala. T2 ....7.75
Fontana,Calif. K1 ....8.55
Gary,Ind. U5 ....7.75
Geneva,Utah C11 ....7.75
Houston S5 ....7.85
Ind.Harbor,Ind. I-2, Y1 7.75
Johnstown,Pa. B2 ....7.80
KansasCity,Mo. S5 ....7.85
Lackawanna,N.Y. B2 ..7.80
LosAngeles B3 ....8.45
Munhall,Pa. U5 ....7.75
Seattle B3 ....8.50
S.Chicago,Ill. U5, W14 ..7.75
S.SanFrancisco B3 ....8.40
Struthers,O. Y1 ....7.75

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 ....7.80
Lackawanna,N.Y. B2 ..7.80
Munhall,Pa. U5 ....7.75
S.Chicago,Ill. U5 ....7.75

PILING

BEARING PILES
Bethlehem,Pa. B2 ....5.325
Lackawanna,N.Y. B2 ..5.325
Munhall,Pa. U5 ....5.275
S.Chicago,Ill. U5 ....5.275

STEEL SHEET PILING
Lackawanna,N.Y. B2 ..6.225
Munhall,Pa. U5 ....6.225
S.Chicago,Ill. U5 ....6.225
Weirton,W.Va. W6 ....6.225

PLATES

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ..5.10
Aliquippa,Pa. J5 ....5.10
Ashland,Ky.(15) A10 ....5.10
Atlanta A11 ....5.30
Bessemer,Ala. T2 ....5.10
Clairton,Pa. U5 ....5.10
Claymont,Del. C22 ....5.10
Cleveland J5, R2 ....5.20
Coatesville,Pa. L7 ....5.10
Conshohocken,Pa. A3 ....5.10
Ecorse,Mich. G5 ....5.10
Fairfield,Ala. T2 ....5.10
Fontana,Calif.(30) K1 ..5.90
Gary,Ind. U5 ....5.10
Geneva,Utah C11 ....5.10
GraniteCity,Ill. G4 ....5.20
Harrisburg,Pa. P4 ....5.10
Houston S5 ....5.20
Ind.Harbor,Ind. I-2, Y1..5.10
Johnstown,Pa. B2 ....5.10
Lackawanna,N.Y. B2 ....5.10
LoneStar,Tex. L6 ....5.20
Mansfield,O. E6 ....5.10
Minnequa,Colo. C10 ....5.95
Munhall,Pa. U5 ....5.10
Newport,Ky. A2 ....5.10
Pittsburgh J5 ....5.10
Riverdale,Ill. A1 ....5.10
Seattle B3 ....6.00
Sharon,Pa. S3 ....5.10
S.Chicago,Ill. U5, W14 ..5.10
SparrowsPoint,Md. B2 ..5.10
Sterling,Ill. N15 ....5.10
Steubenville,O. W10 ....5.10
Warren,O. R2 ....5.10
Youngstown U5, Y1 ....5.10

PLATES, Carbon Abras. Resist.
Claymont,Del. C22 ....6.75
Fontana,Calif. K1 ....7.55
Geneva,Utah C11 ....6.75
Houston S5 ....6.85
Johnstown,Pa. B2 ....6.75
SparrowsPoint,Md. B2 ..6.75

PLATES, Wrought Iron
Economy,Pa. B14 ....13.15

PLATES, H.S., L.A.
Aliquippa,Pa. J5 ....7.625
Bessemer,Ala. T2 ....7.625
Clairton,Pa. U5 ....7.625
Claymont,Del. C22 ....7.625
Cleveland J5, R2 ....7.625
Coatesville,Pa. L7 ....7.625
Conshohocken,Pa. A3 ....7.625
Economy,Pa. B14 ....7.625
Ecorse,Mich. G5 ....7.625
Fairfield,Ala. T2 ....7.625
Farrell,Pa. S3 ....7.625
Fontana,Calif.(30) K1 8.425
Gary,Ind. U5 ....7.625
Geneva,Utah C11 ....7.625
Houston S5 ....7.725
Ind.Harbor,Ind. I-2, Y1..7.625
Johnstown,Pa. B2 ....7.625
Munhall,Pa. U5 ....7.625
Pittsburgh J5 ....7.625
Seattle B3 ....8.525
Sharon,Pa. S3 ....7.625
S.Chicago,Ill. U5, W14 ..7.625
SparrowsPoint,Md. B2 ..7.625
Warren,O. R2 ....7.625
Youngstown U5 ....7.625

PLATES, ALLOY
Aliquippa,Pa. J5 ....7.20
Claymount,Del. C22 ....7.20
Coatesville,Pa. L7 ....7.20
Economy,Pa. B14 ....7.20
Fontana,Calif. K1 ....8.00
Gary,Ind. U5 ....7.20
Houston S5 ....7.30
Ind.Harbor,Ind. Y1 ....7.20
Johnstown,Pa. B2 ....7.20
Lowellville,O. S3 ....7.20
Munhall,Pa. U5 ....7.20
Newport,Ky. A2 ....7.20
Pittsburgh J5 ....7.20
Seattle B3 ....8.10
Sharon,Pa. S3 ....7.20
S.Chicago,Ill. U5, W14 ..7.20
SparrowsPoint,Md. B2 ..7.20
Youngstown Y1 ....7.20

FLOOR PLATES
Cleveland J5 ....6.175
Conshohocken,Pa. A3 ..6.175
Ind.Harbor, Ind. I-2 ..6.175
Munhall,Pa. U5 ....6.175
S.Chicago,Ill. U5 ....6.175

PLATES, Ingot Iron
Ashland c.l.(15) A10 ..5.35
Ashland l.c.l(15) A10 ..5.85
Cleveland c.l. R2 ....5.85
Warren,O. c.l. R2 ....5.85

BARS

BARS, Hot-Rolled Carbon (Merchant Quality)
Ala.City,Ala.(9) R2 ...5.425
Aliquippa,Pa.(9) J5 ..5.425
Alton,Ill. L1 ....5.625
Atlanta(9) A11 ....5.625
Bessemer,Ala.(9) T2 ..5.425
Birmingham(9) C15 ...5.425
Buffalo(9) R2 ....5.425
Clairton,Pa.(9) U5 ....5.425
Cleveland (9) R2 ....5.425
Ecorse,Mich.(9) G5 ....5.425
Emeryville,Calif. J7 ....6.175
Fairfield,Ala.(9) T2 ....5.425
Fairless,Pa.(9) U5 ....5.575
Fontana,Calif.(9) K1 ....6.125
Gary,Ind.(9) U5 ....5.425
Houston(9) S5 ....5.675
Ind.Harbor(9) I-2, Y1..5.425
Johnstown,Pa.(9) B2 ..5.425
Joliet,Ill. P22 ....5.425
KansasCity,Mo.(9) S5..5.675
Lackawanna(9) B2 ....5.425
LosAngeles(9) B3 ....6.125
Midland,Pa.(23) C18 ..5.725
Milton,Pa. M18 ....5.575
Minnequa,Colo. C10 ...5.875
Niles,Calif. P1 ....6.125
N.Tonawanda,N.Y.(23)B11 5.775
Owensboro,Ky.(9) G8 ..5.425
Pittsburg,Calif.(9) C11..6.125
Pittsburgh(9) J5 ....5.425
Portland,Oreg. O4 ....6.175
Seattle B3, N14 ....6.175
S.Ch'e'go(9)R2,U5,W14 5.425
S.Duquesne,Pa.(9) U5 ..5.425
S.SanFran.,Calif.(9)B3 6.175
Sterling,Ill.(1)(9) N15..5.425
Sterling,Ill.(9) N15 ..5.525
Struthers,O.(9) Y1 ....5.425
Tonawanda,N.Y. B12 ..5.425
Torrance,Calif.(9) C11 ..6.125
Youngstown(9)R2, U5 ..5.425

BARS, H.R. Leaded Alloy
(Including leaded extra)
Warren,O. C17 ....7.475

BARS, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.475
Bethlehem,Pa. B2 ....6.475
Bridgeport,Conn. C32 ...6.55
Buffalo R2 ....6.475
Canton,O. R2, T7 ....6.475
Clairton,Pa. U5 ....6.475
Detroit S41 ....6.475
Economy,Pa. B14 ....6.475
Ecorse,Mich. G5 ....6.475
Fairless,Pa. U5 ....6.625
Farrell,Pa. S3 ....6.475
Fontana,Calif. K1 ....7.525
Gary,Ind. U5 ....6.475
Houston S5 ....6.725
Ind.Harbor,Ind. I-2, Y1..6.475
Johnstown,Pa. B2 ....6.475
KansasCity,Mo. S5 ....6.725
Lackawanna,N.Y. B2 ..6.475
Lowellville,O. S3 ....6.475
LosAngeles B3 ....7.525
Massillon,O. R2 ....6.475
Midland,Pa. C18 ....6.475
Owensboro,Ky. G8 ....6.475
Pittsburgh J5 ....6.475
Sharon,Pa. S3 ....6.475
S.Chicago R2, U5, W14 6.475
S.Duquesne,Pa. U5 ....6.475
Struthers,O. Y1 ....6.475
Warren,O. C17 ....6.475
Youngstown U5 ....6.475

BARS & SMALL SHAPES, H.R.
High-Strength, Low-Alloy
Aliquippa,Pa. J5 ....7.925
Bessemer,Ala. T2 ....7.925
Bethlehem,Pa. B2 ....7.925
Clairton,Pa. U5 ....7.925
Cleveland R2 ....7.925
Ecorse,Mich. G5 ....7.925
Fairfield,Ala. T2 ....7.925
Fontana,Calif. K1 ....8.625
Gary,Ind. U5 ....7.925
Houston S5 ....8.175
Ind.Harbor,Ind. Y1 ....7.925
Johnstown,Pa. B2 ....7.925
KansasCity,Mo. S5 ....8.175
Lackawanna,N.Y. B2 ..7.925
LosAngeles B3 ....8.625
Pittsburgh J5 ....7.925
Seattle B3 ....8.675
S.Chicago,Ill. U5, W14 7.925
S.Duquesne,Pa. U5 ....7.925
S.SanFrancisco B3 ....8.675
Struthers,O. Y1 ....7.925
Youngstown U5 ....7.925

BAR SIZE ANGLE; H.R. Carbon
Bethlehem,Pa.(9) B2 ..5.575
Houston(9) S5 ....5.675
KansasCity,Mo.(9) S5 ..5.675
Lackawanna(9) B2 ....5.425
Sterling,Ill. N15 ....5.525
Sterling,Ill.(1) N15 ....5.425
Tonawanda,N.Y. B12 ..5.425

BAR SIZE ANGLES; S. Shapes
Aliquippa,Pa. J5 ....5.425
Atlanta A11 ....5.625
Joliet,Ill. P22 ....5.425
Niles,Calif. P1 ....6.125
Pittsburgh J5 ....5.425
Portland,Oreg. O4 ....6.175
SanFrancisco S7 ....6.275
Seattle B3 ....6.175

BAR SHAPES, Hot-Rolled Alloy
Aliquippa,Pa. J5 ....6.55
Clairton,Pa. U5 ....6.55
Gary,Ind. U5 ....6.55
Houston S5 ....6.80
KansasCity,Mo. S5 ....6.80
Pittsburgh J5 ....6.55
Youngstown U5 ....6.55

BARS, C.F., Leaded Alloy
(Including leaded extra)
Ambridge,Pa. W18 ....9.925
BeaverFalls,Pa. M12 ..9.925
Camden,N.J. P13 ....10.10
Chicago W18 ....9.925
Cleveland C32 ....9.925*
Elyria,O. W8 ....9.925
LosAngeles P2, S30..11.40*
Monaca,Pa. S17 ....9.925
Newark,N.J. W18 ....10.10
SpringCity,Pa. K3 ....10.10
Warren,O. C17 ....9.925

*Grade A; add 0.50c for Grade B.

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 ....7.30
BeaverFalls,Pa. M12,R2 7.30
Birmingham C15 ....7.90
Buffalo B5 ....7.35
Camden,N.J. P13 ....7.75
Carnegie,Pa. C12 ....7.30
Chicago W18 ....7.30
Cleveland A7, C20 ....7.30
Detroit B5, P17 ....7.50
Detroit S41 ....7.30
Donora,Pa. A7 ....7.30
Elyria,O. W8 ....7.30
FranklinPark,Ill. N5 ....7.30
Gary,Ind. R2 ....7.30
GreenBay,Wis. F7 ....7.30
Hammond,Ind. J5, L2 ....7.30
Hartford,Conn. R2 ....7.80
Harvey,Ill. B5 ....7.30
LosAngeles(49) S30 ....8.75
LosAngeles P2, R2 ....8.75
Mansfield,Mass. B5 ....7.85
Massillon,O. R2, R8 ....7.30
Midland,Pa. C18 ....7.30
Monaca,Pa. S17 ....7.30
Newark,N.J. W18 ....7.75
NewCastle,Pa.(17) B4 ....7.30
Pittsburgh J5 ....7.30
Plymouth,Mich. P5 ....7.55
Putnam,Conn. W18 ....7.85
Readville,Mass. C14 ....7.85
S.Chicago,Ill. W14 ....7.30
SpringCity,Pa. K3 ....7.75
Struthers,O. Y1 ....7.30
Warren,O. C17 ....7.30
Willimantic,Conn. J5 ....7.80
Waukegan,Ill. A7 ....7.30
Youngstown F3, Y1 ....7.30

BARS, Cold-Finished Carbon
(Turned and Ground)
Cumberland,Md.(5) C19..6.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 ....8.775
BeaverFalls,Pa. M12,R2 8.775
Bethlehem,Pa. B2 ....8.775
Bridgeport,Conn. C32 ..8.925
Buffalo B5 ....8.775
Camden,N.J. P13 ....8.95
Canton,O. T7 ....8.775
Carnegie,Pa. C12 ....8.775
Chicago W18 ....8.775
Cleveland A7, C20 ....8.775
Detroit B5, P17 ....8.975
Detroit S41 ....8.775
Donora,Pa. A7 ....8.775
Elyria,O. W8 ....8.775
FranklinPark,Ill. N5 ....8.775
Gary,Ind. R2 ....8.775
GreenBay, Wis. F7 ....8.775
Hammond,Ind. J5, L2 ....8.775
Hartford,Conn. R2 ....9.075
Harvey,Ill. B5 ....8.775
Lackawanna,N.Y. B2 ....8.775
LosAngeles P2, S30 ....10.75
Mansfield,Mass. B5 ....9.075
Massillon,O. R2, R8 ....8.775
Midland,Pa. C18 ....8.775
Monaca,Pa. S17 ....8.775
Newark,N.J. W18 ....8.95
Plymouth,Mich. P5 ....8.975
S.Chicago,Ill. W14 ....8.775
SpringCity,Pa. K3 ....8.95
Struthers,O. Y1 ....8.775
Warren,O. C17 ....8.775
Waukegan,Ill. A7 ....8.775
Willimantic,Conn. J5 ....9.075
Worcester,Mass. A7 ....9.075
Youngstown F3, Y1 ....8.775

BARS, Reinforcing (To Fabricators)

AlabamaCity,Ala. R2 ..5.425
Atlanta A11 .....5.425
Birmingham C15 .....5.425
Buffalo R2 .....5.425
Cleveland R2 .....5.425
Ecorse,Mich. G5 .....5.425
Emeryville,Calif. J7 ..6.175
Fairfield,Ala. T2 .....5.425
Fairless,Pa. U5 .....5.525
Fontana,Calif. K1 ...6.125
Ft.Worth,Tex.(4)(26)T4 5.525
Gary,Ind. U5 .....5.425
Houston S5 .....5.525
Ind.Harbor,Ind. I-2, Y1 5.425
Johnstown,Pa. B2 .....5.425
Joliet, Ill. P22 .....5.425
KansasCity,Mo. S5 ....5.625
Kokomo,Ind. C16 .....5.525
Lackawanna,N.Y. B2..5.425
LosAngeles B3 .....6.125
Milton,Pa. M18 .....5.575
Minnequa,Colo. C10 ...5.525
Niles,Calif. P1 .....6.125
Pittsburg,Calif. C11 ...6.125
Pittsburgh J5 .....5.425
Portland,Oreg. O4 ....6.175
SandSprings,Okla. S5..5.525
Seattle B3, N14 .....6.175
S.Chicago,Ill. R2 .....5.425
S.Duquesne,Pa. U5 ....5.425
S.SanFrancisco B3 .....6.175
SparrowsPoint,Md. B2..5.425
Sterling,Ill.(1) N15 ...5.425
Sterling,Ill. N15 .....5.525
Struthers,O. Y1 .....5.425
Tonawanda,N.Y. B12 ..6.00
Torrance,Calif. C11 ...6.125
Youngstown R2, U5..5.425

BARS, Reinforcing (Fabricated; to Consumers)

Boston B2, U5 .....7.65
Chicago U5 .....6.91
Cleveland U5 .....6.89
Houston S5 .....7.35
Johnstown,Pa. B2 .....7.08
KansasCity,Mo. S5 ....7.35
Lackawanna,N.Y. B2 ..6.85
Marion,O. P11 .....6.70
Newark,N.J. U5 .....7.55
Philadelphia U5 .....7.38
Pittsburgh J5, U5 .....7.10
SandSprings,Okla. S5 ...7.60
Seattle B3, N14 .....7.70
SparrowsPt.,Md. B2 ...7.08
St.Paul U5 .....7.92
Williamsport,Pa. S19 ..7.00

BARS, Wrought Iron

Economy,Pa.(S.R.)B14 14.45
Economy,Pa.(D.R.)B14 18.00
Economy(Staybolt-B14 .18.45

RAIL STEEL BARS

ChicagoHts.(3) C2, I-2 5.325
ChicagoHts. (4)(44) I-2 5.425
ChicagoHts.(4) C2 ....5.425
Franklin,Pa.(3) F5 ...5.325
Franklin,Pa.(4) F5 ...5.425
JerseyShore,Pa.(3) J8 ..5.50
Marion,O.(3) P11 ....5.325
Tonawanda(3) B12 ..5.325
Tonawanda(4) B12 ...6.00
Williamsport,Pa.(3) S19 5.50

SHEETS

SHEETS, Hot-Rolled Steel (18 Gage and Heavier)

AlabamaCity,Ala. R2 ..4.925
Allenport,Pa. P7 .....4.925
Ashland,Ky.(8) A10 ..4.925
Cleveland J5, R2 .....4.925
Conshohocken,Pa. A3 ..4.975
Detroit(8) M1 .....4.925
Ecorse,Mich. G5 .....4.925
Fairfield,Ala. T2 .....4.925
Fairless,Pa. U5 .....4.975
Fontana,Calif. K1 .....5.075
Gary,Ind. U5 .....4.925
Geneva,Utah C11 .....5.025
GraniteCity,Ill.(8) G4 5.025
Ind.Harbor,Ind. I-2, Y1 4.925
Irvin,Pa. U5 .....4.925
Lackawanna,N.Y. B2 ..4.925
Mansfield,O. E6 .....4.925
Munhall,Pa. U5 .....4.925
Newport,Ky.(8) A2 ....4.925
Niles,O. M21, S3 .....4.925
Pittsburg,Calif. C11 ...5.625
Pittsburgh J5 .....4.925
Portsmouth,O. P12 ....4.925
Riverdale,Ill. A1 .....4.925
Sharon,Pa. S3 .....4.925
S.Chicago,Ill. W14 ....4.925
SparrowsPoint,Md. B2 4.925
Steubenville,O. W10 ...4.925
Warren,O. R2 .....4.925
Weirton,W.Va. W6 ....4.925
Youngstown U5, Y1 ....4.925

SHEETS, H.R. (19) Ga. & Lighter

Niles,O. M21 .....6.05

SHEETS, H.R. Alloy

Gary,Ind. U5 .....8.10
Ind.Harbor,Ind. Y1 ....8.10
Irvin,Pa. U5 .....8.10
Munhall,Pa. U5 .....8.10
Newport,Ky. A2 .....8.10
Youngstown U5, Y1 ....8.10

SHEETS, H.R. (14 Ga. & Heavier) High-Strength, Low-Alloy

Cleveland J5, R2 .....7.275
Conshohocken,Pa. A3 ..7.325
Ecorse,Mich. G5 .....7.275
Fairfield,Ala. T2 .....7.275
Fairless,Pa. U5 .....7.325
Farrell,Pa. S3 .....7.275
Fontana,Calif. K1 ....8.025
Gary,Ind. U5 .....7.275
Ind.Harbor,Ind. I-2, Y1 7.275
Irvin,Pa. U5 .....7.275
Lackawanna(35) B2 ..7.275
Munhall,Pa. U5 .....7.275
Pittsburgh J5 .....7.275
S.Chicago,Ill. U5, W14 7.275
Sharon,Pa. S3 .....7.275
SparrowsPoint(36) B2 7.275
Warren,O. R2 .....7.275
Weirton,W.Va. W6 ...7.275
Youngstown U5, Y1 ..7.275

SHEETS, Hot-Rolled Ingot Iron (18 Gage and Heavier)

Ashland,Ky.(8) A10 ..5.175
Cleveland R2 .....5.675
Warren,O. R2 .....5.675

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2 .....6.80
Middletown,O. A10 ....6.55
Warren,O. R2 .....6.80

SHEETS, Cold-Rolled Steel (Commercial Quality)

AlabamaCity,Ala. R2 ..6.05
Allenport,Pa. P7 .....6.05
Cleveland J5, R2 .....6.05
Conshohocken,Pa. A3 ..6.10
Detroit M1 .....6.05
Ecorse,Mich. G5 .....6.05
Fairfield,Ala. T2 .....6.05
Fairless,Pa. U5 .....6.10
Follansbee,W.Va. F4....6.05
Fontana,Calif. K1 ....7.30
Gary,Ind. U5 .....6.05
GraniteCity,Ill. G4 ....6.15
Ind.Harbor,Ind. I-2, Y1 6.05
Irvin,Pa. U5 .....6.05
Lackawanna,N.Y. B2 ..6.05
Mansfield,O. E6 .....6.05
Middletown,O. A10 ....6.05
Newport,Ky. A2 .....6.05
Pittsburg,Calif. C11...7.00
Pittsburgh J5 .....6.05
Portsmouth,O. P12 ....6.05
SparrowsPoint,Md. B2..6.05
Steubenville,O. W10 ....6.05
Warren,O. R2 .....6.05
Weirton,W.Va. W6 ....6.05
Yorkville,O. W10 .....6.05
Youngstown Y1 .....6.05

SHEETS, Cold-Rolled, High-Strength, Low Alloy

Cleveland J5, R2 ....8.975
Ecorse,Mich. G5 .....8.975
Fairless,Pa. U5 .....9.025
Fontana,Calif. K1 ..10.275
Gary,Ind. U5 .....8.975
IndianaHarbor,Ind. Y1 8.975
Irvin,Pa. U5 .....8.975
Pittsburgh J5 .....8.975
SparrowsPoint(38) B2..8.975
Warren,O. R2 .....8.975
Weirton,W.Va. W6 ....8.975
Youngstown Y1 .....8.975

SHEETS, Culvert

	Cu Steel	Cu Fe
Ashland,Ky. A10	6.95	7.20
Canton,O. R2	6.95	7.45
Fairfield T2	6.95	7.20
Gary,Ind. U5	6.95	7.20
GraniteCity,Ill. G4	7.05	...
Ind.Harbor I-2	6.95	7.20
Irvin,Pa. U5	6.95	7.20
Kokomo,Ind. C16	7.05	...
MartinsFry. W10	6.95	7.20
Pitts.,Calif. C11	7.70	...
Pittsburgh J5	6.95	...
SparrowsPt. B2	6.95	...

SHEETS, Culvert—Pure Iron

Ind.Harbor,Ind. I-2 ....7.20

SHEETS, Galvanized Steel Hot-Dipped

AlabamaCity,Ala. R2. 6.60†
Ashland,Ky. A10 .... 6.60†
Canton,O. R2 ..... 6.60†
Dover,O. E6 ..... 6.60†
Fairfield,Ala. T2 .... 6.60†
Gary,Ind. U5 ..... 6.60†
GraniteCity,Ill. G4 .... 6.70*
Ind.Harbor,Ind. I-2.... 6.60†
Irvin,Pa. U5 ..... 6.60†
Kokomo,Ind. C16 .... 6.70†
MartinsFerry,O. W10 ..6.60*
Middletown,O. A10 ....6.60†
Pittsburg,Calif. C11 ...7.35*
Pittsburgh J5 ..... 6.60†
SparrowsPt.,Md. B2 .. 6.60†
Warren,O. R2 ..... 6.60†
Weirton,W.Va. W6 ....6.60*

*Continuous and noncontinuous. †Continuous. ‡Noncontinuous.

SHEETS, Well Casing

Fontana,Calif. K1 ....7.175

SHEETS, Galvanized High-Strength, Low-Alloy

Irvin,Pa. U5 .....9.725
SparrowsPt.(39) B2 ...9.725

SHEETS, Galvannealed Steel

Canton,O. R2 .....7.00
Irvin,Pa. U5 .....7.00

SHEETS, Galvanized Ingot Iron (Hot-Dipped Continuous)

Ashland,Ky. A10 .....6.85
Middletown,O. A10 ....6.85

SHEETS, Electrogalvanized

Cleveland(28) R2 ....7.425
Niles,O.(28) R2 .....7.425
Youngstown J5 .....7.275
Weirton,W.Va. W6 ....7.275

SHEETS, Aluminum Coated

Butler,Pa. A10 (type 1) 9.25
Butler,Pa. A10 (type 2) 9.35

SHEETS, Enameling Iron

Ashland,Ky. A10 .....6.625
Cleveland R2 .....6.625
Fairfield,Ala. T2 .....6.625
Gary,Ind. U5 .....6.625
GraniteCity,Ill. G4 ....6.725
Ind.Harbor,Ind. I-2, Y1 6.625
Irvin,Pa. U5 .....6.625
Middletown,O. A10 ....6.625
Niles,O. M21, S3 .....6.625
Youngstown Y1 .....6.625

BLUED STOCK, 29 Gage

Follansbee,W.Va. F4 ..8.65
Ind.Harbor,Ind. I-2 ..8.475
Yorkville,O. W10 .....8.475

SHEETS, Long Terne, Steel (Commercial Quality)

BeechBottom,W.Va. W10 7.00
Gary,Ind. U5 .....7.00
Mansfield,O. E6 .....7.00
Middletown,O. A10 ....7.00
Niles,O. M21, S3 .....7.00
Warren,O. R2 .....7.00
Weirton,W.Va. W6 ....7.00

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10 ....7.40

Key To Producers

A1 Acme Steel Co.
A2 Acme-Newport Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A5 Alloy Metal Wire Div., H. K. Porter Co. Inc.
A6 American Shim Steel Co.
A7 American Steel & Wire Div., U. S. Steel Corp.
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.

B1 Babcock & Wilcox Co.
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B8 Braeburn Alloy Steel
B9 Brainard Steel Div., Sharon Steel Corp.
B10 E. & G. Brooke, Wickwire Spencer Steel Div., Colo. Fuel & Iron
B11 Buffalo Bolt Co., Div. Buffalo Eclipse Corp.
B12 Buffalo Steel Corp.
B14 A. M. Byers Co.
B15 J. Bishop & Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div., Borg-Warner Corp.
C4 Carpenter Steel Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia-Geneva Steel
C12 Columbia Steel & Shaft.
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft.
C15 Connors Steel Div. H. K. Porter Co. Inc.
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Plant, Wickwire Spencer Steel Div., Colo. Fuel & Iron
C23 Charter Wire Inc.
C24 G. O. Carlson Inc.
C32 Carpenter Steel of N.Eng.

D2 Detroit Steel Corp.
D3 Dearborn Div., Sharon Steel Corp.
D4 Disston Div., H. K. Porter Co. Inc.
D6 Driver-Harris Co.
D7 Dickson Weatherproof Nail Co.
D8 Damascus Tube Co.
D9 Wilbur B. Driver Co.

E1 Eastern Gas&FuelAssoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire-Reeves Steel Corp.

F2 Firth Sterling Inc.
F3 Fitzsimmons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div., Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
F8 Ft. Wayne Metals Inc.

G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.
G8 Green River Steel Corp.

H1 Hanna Furnace Corp.
H7 Helical Tube Co.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.
I-6 Ivins Steel Tube Works
I-7 Indiana Steel & Wire Co.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro-Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire
K7 Kenmore Metals Corp.

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Steel Co.
L6 Lone Star Steel Co.
L7 Lukens Steel Co.
L8 Leschen Wire Rope Div., H. K. Porter Co. Inc.
M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M6 Mercer Pipe Div., Sawhill Tubular Products
M8 Mid-States Steel & Wire
M12 Moltrup Steel Products
M14 McInnes Steel Co.
M16 Md. Fine&Special Wire
M17 Metal Forming Corp.
M18 Milton Steel Div., Merritt-Chapman&Scott
M21 Mallory-Sharon Metals Corp.
M22 Mill Strip Products Co.
N1 National-Standard Co.
N2 National Supply Co.
N3 National Tube Div., U. S. Steel Corp.
N5 Nelsen Steel & Wire Co.
N6 New England High Carbon Wire Co.
N8 Newman-Crosby Steel
N14 Northwest. Steel Rolling Mills Inc.
N15 Northwestern S.&W.Co.
N20 Neville Ferro Alloy Co.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co., Sub. of Barium Steel Corp.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P11 Pollak Steel Co.
P12 Portsmouth Div., Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., American Chain & Cable
P17 Plymouth Steel Corp.
P19 Pitts. Rolling Mills
P20 Prod. Steel Strip Corp.
P22 Phoenix Mfg. Co.
P24 Phil. Steel & Wire Corp.

R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R8 Reliance Div., Eaton Mfg.
R9 Rome Mfg. Co.
R10 Rodney Metals Inc.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S4 Sharon Tube Co.
S5 Sheffield Div., Armco Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S12 Spencer Wire Corp.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S17 Superior Drawn Steel Co.
S18 Superior Steel Div., Copperweld Steel Co.
S19 Sweet's Steel Co.
S20 Southern States Steel
S23 Superior Tube Co.
S25 Stainless Welded Prod.
S26 Specialty Wire Co. Inc.
S30 Sierra Drawn Steel Corp.
S40 Seneca Steel Service
S41 Stainless Steel Div., J&L Steel Corp.
S42 Southern Elec. Steel Co.
T2 Tenn. Coal & Iron Div., U. S. Steel Corp.
T3 Tenn. Products & Chemical Corp.
T4 Texas Steel Co.
T5 Thomas Strip Div., Pittsburgh Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div., Am. Rad. & Stan. San.
T13 Tube Methods Inc.
T19 Techalloy Co. Inc.

U4 Universal-Cyclops Steel
U5 United States Steel Corp.
U6 U. S. Pipe & Foundry
U7 Ulbrich Stainless Steels
U8 U. S. Steel Supply Div., U. S. Steel Corp.

V2 Vanadium-Alloys Steel
V3 Vulcan-Kidd Steel Div., H. K. Porter Co.

W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W8 Western Automatic Machine Screw Co.
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div., International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.

Y1 Youngstown Sheet & Tube

STRIP

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	4.925
Allenport,Pa. P7	4.925
Alton, Ill. L1	5.125
Ashland,Ky.(8) A10	4.925
Atlanta A11	4.925
Bessemer,Ala. T2	4.925
Birmingham C15	4.925
Buffalo(27) R2	4.925
Conshohocken,Pa. A3	4.975
Detroit M1	5.025
Ecorse,Mich. G5	4.925
Fairfield,Ala. T2	4.925
Fontana,Calif. K1	5.675
Gary,Ind. U5	4.925
Ind.Harbor,Ind. I-2, Y1	4.925
Johnstown,Pa.(25) B2	4.925
Lackaw'na,N.Y.(25) B2	4.925
LosAngeles(25) B3	5.675
Minnequa,Colo. C10	6.025
Riverdale,Ill. A1	4.925
SanFrancisco S7	6.35
Seattle(25) B3	5.925
Seattle N14	6.35
Sharon,Pa. S3	4.925
S.Chicago W14	4.925
S.SanFrancisco(25) B3	5.675
SparrowsPoint,Md. B2	4.925
Sterling,Ill.(1) N15	4.925
Sterling Ill. N15	5.025
Torrance,Calif. C11	5.675
Warren,O. R2	4.925
Weirton,W.Va. W6	4.925
Youngstown U5	4.925

STRIP, Hot-Rolled Alloy

Carnegie,Pa. S18	8.10
Farrell,Pa. S3	8.10
Gary,Ind. U5	8.10
Houston S5	8.35
Ind.Harbor,Ind. Y1	8.10
KansasCity,Mo. S5	8.25
LosAngeles B3	9.30
Lowellville,O. S3	8.10
Newport,Ky. A2	8.10
Sharon,Pa. A2, S3	8.10
S.Chicago,Ill. W14	8.10
Youngstown U5, Y1	8.10

STRIP, Hot-Rolled High-Strength, Low-Alloy

Bessemer,Ala. T2	7.325
Conshohocken,Pa. A3	7.325
Ecorse,Mich. G5	7.325
Fairfield,Ala. T2	7.325
Farrell,Pa. S3	7.325
Gary,Ind. U5	7.325
Ind.Harbor,Ind. I-2, Y1	7.325
Lackawanna,N.Y. B2	7.325
LosAngeles(25) B3	8.075
Seattle(25) B3	8.325
Sharon,Pa. S3	7.325
S.Chicago,Ill. W14	7.325
S.SanFrancisco(25) B3	8.075
SparrowsPoint,Md. B2	7.325
Warren,O. R2	7.325
Weirton,W.Va. W6	7.325
Youngstown U5, Y1	7.325

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky.(8) A10	5.175
Warren,O. R2	5.675

STRIP, Cold-Rolled Carbon

Anderson,Ind. G6	7.15
Baltimore T6	7.15
Boston T6	7.70
Buffalo S40	7.15
Cleveland A7, J5	7.15
Dearborn,Mich. D2	7.15
Detroit D2, M1, P20	7.15
Dover,O. G6	7.15
Ecorse,Mich. G5	7.15
Evanston,Ill. M22	7.25
Follansbee,W.Va. F4	7.15
Fontana,Calif. K1	9.00
FranklinPark,Ill. T6	7.25
Ind.Harbor,Ind. Y1	7.15
Indianapolis J5	7.30
LosAngeles J5	9.05
LosAngeles C1	9.20
NewBedford,Mass. R10	7.60
NewBritain,Conn. S15	7.60
NewCastle,Pa. B4, E5	7.15
NewHaven,Conn. D2	7.60
NewKensington,Pa. A6	7.15
Pawtucket,R.I. R3	7.80
Pawtucket,R.I. N8	7.70
Philadelphia P24	7.70
Pittsburgh J5	7.15
Riverdale,Ill. A1	7.25
Rome,N.Y.(32) R6	7.15
Sharon,Pa. S3	7.15
Trenton,N.J.(31) R5	8.60
Wallingford,Conn. W2	7.60
Warren,O. R2, T5	7.15
Weirton,W.Va. W6	7.15
Worcester,Mass. A7	7.70
Youngstown J5, Y1	7.15

STRIP, Cold-Rolled Alloy

Boston T6	15.40
Carnegie,Pa. S18	15.05
Cleveland A7	15.05
Dover,O. G6	15.05
Farrell,Pa. S3	15.05
FranklinPark,Ill. T6	15.05
Harrison,N.J. C18	15.05
Indianapolis J5	15.20
Lowellville,O. S3	15.05
Pawtucket,R.I. N8	15.40
Riverdale,Ill. A1	15.05
Sharon,Pa. S2	15.05
Worcester,Mass. A7	15.35
Youngstown J5	15.05

STRIP, Cold-Rolled High-Strength, Low-Alloy

Cleveland A7	10.45
Dearborn,Mich. D3	10.60
Dover,O. G6	10.45
Ecorse,Mich. G5	10.50
Farrell,Pa. S3	10.50
Ind.Harbor,Ind. Y1	10.65
Sharon,Pa. S3	10.50
Warren,O. R2	10.45

STRIP, Cold-Rolled Spring Steel (Annealed)

	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Baltimore T6	9.50	10.70	12.90	15.90	18.85
Boston T6	9.50	10.70	12.90	15.90	18.85
Bristol,Conn. W1	...	10.70	12.90	16.10	19.30
Carnegie,Pa. S18	8.95	10.40	12.60	15.60	....
Cleveland A7	8.95	10.40	12.60	15.60	18.55
Dearborn,Mich. D3	9.05	10.50	12.70	....	....
Detroit D2	9.05	10.50	12.70	15.70	....
Dover,O. G6	8.95	10.40	12.60	15.60	18.55
Evanston,Ill. M22	8.95	10.40	12.60	15.60	....
Fostoria,O. S1	10.05	10.40	12.60	15.60	....
FranklinPark,Ill. T6	9.05	10.40	12.60	15.60	18.55
Harrison,N.J. C18	...	...	12.90	16.10	19.30
Indianapolis J5	9.10	10.55	12.60	15.60	18.55
LosAngeles C1	11.15	12.60	14.80	17.80	....
LosAngeles J5	11.15	12.60	14.80	....	....
NewBritain,Conn. S15	9.40	10.70	12.90	15.90	18.85
NewCastle,Pa. B4, E5	8.95	10.40	12.60	15.60	....
NewHaven,Conn. D2	9.40	10.70	12.90	15.90	....
NewKensington,Pa. A6	8.95	10.40	12.60	15.60	....
NewYork W3	...	10.70	12.90	16.10	19.30
Pawtucket,R.I. N8	9.50	10.70	12.90	15.90	18.85
Riverdale,Ill. A1	9.05	10.40	12.60	15.60	18.55
Rome,N.Y.(32) R6	8.95	10.40	12.60	15.60	18.55
Sharon,Pa. S3	8.95	10.40	12.60	15.60	18.55
Trenton,N.J. R5	...	10.70	12.90	16.10	19.30
Wallingford,Conn. W2	9.40	10.70	12.90	15.90	18.75
Warren,O. T5	8.95	10.40	12.60	15.60	18.55
Worcester,Mass. A7, T6	9.50	10.70	12.90	15.90	18.85
Youngstown J5	8.95	10.40	12.60	15.60	18.55

STRIP, Cold-Rolled Spring Steel (Tempered)

	Up to 0.80C	0.81-1.05C	1.06-1.35C
Bristol,Conn. W1	18.10	21.95	26.30
Buffalo W12	18.10	....	....
Fostoria,O. S1	18.30	22.15	....
FranklinPark,Ill. T6	18.45	22.30	26.65
Harrison,N.J. C18	18.10	21.95	26.30
NewYork W3	18.10	21.95	26.30
Palmer,Mass. W12	18.10	....	....
Trenton,N.J. R5	18.10	21.95	26.30
Worcester,Mass. A7, T6	18.10	21.95	26.30
Youngstown J5	18.45	22.30	26.65

Weirton,W.Va. W6	10.50
Youngstown Y1	10.65

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2	7.90

STRIP, C.R. Electrogalvanized

Cleveland A7	7.15*
Dover,O. G6	7.15*
Evanston,Ill. M22	7.25*
Riverdale,Ill. A1	7.25*
Warren,O. B9, T5	7.15*
Worcester,Mass. A7	7.70*
Youngstown J5	7.15*

*Plus galvanizing extras.

STRIP, Galvanized (Continuous)

Sharon,Pa. S3	7.275

TIGHT COOPERAGE HOOP

Atlanta A11	5.65
Riverdale,Ill. A1	5.50
Sharon,Pa. S3	5.35
Youngstown U5	5.35

SILICON STEEL

H.R. SHEETS(22 Ga., cut lengths)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	11.80	12.90	13.95
Mansfield,O. E6	9.625	11.10	11.80	12.90	13.95
Newport,Ky. A2	9.625	11.10	11.80	12.90	13.95
Niles,O. M21, S3	9.625	11.10	11.80	12.90	....
Vandergrift,Pa. U5	....	11.10	11.80	12.90	13.95
Warren,O. R2	9.625	11.10	11.80	12.90	....
Zanesville,O. A10	....	11.10	11.80	12.90	13.95

C.R. COILS & CUT LENGTHS (22 Ga.) Fully Processed (Semiprocessed ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.Va. W10	....	11.35	12.05	13.15	14.20
Brackenridge,Pa. A4	....	....	12.05	13.15	14.20
GraniteCity,Ill. G4	9.725*	10.95*	11.65*	12.75*	....
IndianaHarbor,Ind. I-2	9.625*	10.85*	11.75*	12.65*	....
Mansfield,O. E6	9.625*	11.35	12.05	13.15	14.20
Vandergrift,Pa. U5	9.625*	11.35	12.05	13.15	14.20
Warren,O. R2	9.625*	11.35	12.05	13.15	14.20
Zanesville,O. A10	....	11.35	12.05	13.15	14.20
					Stator
Vandergrift,Pa. U5	....	....	....	....	7.85

H.R. SHEETS (22 Ga., cut lengths)	T-72	T-65	T-58	T-52
BeechBottom,W.Va. W10	15.00	15.55	16.05	17.10
Vandergrift,Pa. U5	15.00	15.50	16.05	17.10
Zanesville,O. A10	15.00	15.55	16.05	17.10

C.R. COILS & CUT LENGTHS (22 Ga.)	Grain Oriented T-100	T-90	T-80	T-73	T-66	T-72
Brackenridge,Pa. A4	17.60	17.60	19.20	19.70	20.20	15.25††
Butler,Pa. A10	....	....	19.20	19.70	20.20	....
Vandergrift,Pa. U5	16.60	17.60	19.20	19.70	20.20	15.25**
Warren,O. R2	....	....	....	....	....	15.25‡

*Semiprocessed. †Fully processed only. ‡Coils, annealed, semiprocessed ½c lower. **Cut lengths, ¼-cent lower. ††Coils only.

TIN MILL PRODUCTS

TIN PLATE, Electrolytic (Base Box)	0.25 lb	0.50 lb	0.75 lb
Aliquippa,Pa. J5	$8.75	$9.00	$9.40
Fairfield,Ala. T2	8.85	9.10	9.50
Fairless,Pa. U5	8.85	9.10	9.50
Fontana,Calif. K1	9.50	9.75	10.15
Gary,Ind. U5	8.75	9.00	9.40
GraniteCity,Ill. G4	8.85	9.10	9.50
IndianaHarbor,Ind. I-2, Y1	8.75	9.00	9.40
Irvin,Pa. U5	8.75	9.00	9.40
Niles,O. R2	8.75	9.00	9.40
Pittsburg,Calif. C11	9.50	9.75	10.15
SparrowsPoint,Md. B2	8.85	9.10	9.50
Weirton,W.Va. W6	8.75	9.00	9.40
Yorkville,O. W10	8.75	9.00	9.40

ELECTROTIN (22-27 Gage; Dollars per 100 lb)			
Aliquippa,Pa. J5	7.725	7.925	....
Niles,O. R2	7.725	7.925	8.125

TIN PLATE, American	1.25 lb	1.50 lb
Aliquippa,Pa.J5	$10.05	$10.30
Fairfield,Ala. T2	10.15	10.40
Fairless,Pa. U5	10.15	10.40
Fontana,Calif.K1	10.80	11.05
Gary,Ind. U5	10.05	10.30
Ind.Harb. Y1	10.05	10.30
Pitts.,Calif. C11	10.80	11.05
Sp.Pt.,Md. B2	10.15	10.40
Weirton,W.Va.W6	10.05	10.30
Yorkville,O. W10	10.05	10.30

BLACK PLATE (Base Box)	
Aliquippa,Pa. J5	$7.85
Fairfield,Ala. T2	7.95
Fairless,Pa. U5	7.95
Fontana,Calif. K1	8.60
Gary,Ind. U5	7.85
GraniteCity,Ill. G4	7.95
Ind.Harbor,Ind. I-2, Y1	7.85
Irvin,Pa. U5	7.85
Niles,O. R2	7.85
Pittsburg,Calif. C11	8.60
SparrowsPoint,Md. B2	7.95
Weirton,W.Va. W6	7.85
Yorkville,O. W10	7.85

HOLLOWARE ENAMELING Black Plate (29 Gage)	
Aliquippa,Pa. J5	$7.50
Gary,Ind. U5	7.50
GraniteCity,Ill. G4	7.60
Ind.Harbor,Ind. Y1	7.50
Irvin,Pa. U5	7.50
Yorkville,O. W10	7.50

MANUFACTURING TERNES (Special Coated, Base Box)	
Gary,Ind. U5	$9.70
Irvin,Pa. U5	9.70

ROOFING SHORT TERNES (8 lb Coated, Base Box)	
Gary,Ind. U5	$11.25

WIRE

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2	7.65
Aliquippa,Pa. J5	7.65
Alton,Ill. L1	7.85
Atlanta A11	7.65
Bartonville,Ill. K4	7.75
Buffalo W12	7.65
Chicago W13	7.65
Cleveland A7, C20	7.65
Crawfordsville,Ind. M8	7.75
Donora,Pa. A7	7.65
Duluth A7	7.65
Fairfield,Ala. T2	7.65
Fostoria,O.(24) S1	7.75
Houston S5	7.90
Jacksonville,Fla. M8	8.00
Johnstown,Pa. B2	7.65
Joliet,Ill. A7	7.65
KansasCity,Mo. S5	7.90
Kokomo,Ind. C16	7.75
LosAngeles B3	8.60
Minnequa,Colo. C10	7.90
Monessen,Pa. P7, P16	7.65
N.Tonawanda,N.Y. B11	7.65
Palmer,Mass. W12	7.95
Pittsburg,Calif. C11	8.60
Portsmouth,O. P12	7.65
Rankin,Pa. A7	7.65
S.Chicago,Ill. R2	7.65
S.SanFrancisco C10	8.60
SparrowsPoint,Md. B2	7.75
Sterling,Ill.(1) N15	7.65
Sterling,Ill. N15	7.75
Struthers,O. Y1	7.65
Waukegan,Ill. A7	7.65
Worcester,Mass. A7	7.95

WIRE, Gal'd., for ACSR

Bartonville,Ill. K4	12.65
Buffalo W12	12.65
Cleveland A7	12.65
Donora,Pa. A7	12.65
Duluth A7	12.65
Johnstown,Pa. B2	12.65
Minnequa,Colo. C10	12.775
Monessen,Pa. P7, P16	12.65
Muncie,Ind. I-7	12.85
NewHaven,Conn. A7	12.95
Palmer,Mass. W12	12.95
Pittsburg,Calif. C11	13.45
Portsmouth,O. P12	12.65
Roebling,N.J. R5	12.95
SparrowsPt.,Md. B2	12.75
Struthers,O. Y1	12.65
Trenton,N.J. A7	12.95
Waukegan,Ill. A7	12.65
Worcester,Mass. A7	12.95

WIRE, Upholstery Spring

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
NewHaven,Conn. A7	9.60
Palmer,Mass. W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester,Mass. A7	9.60

WIRE, MB Spring, High-Carbon

Aliquippa,Pa. J5	9.30
Alton,Ill. L1	9.50
Bartonville,Ill. K4	9.40
Buffalo W12	9.30
Cleveland A7	9.30
Donora,Pa. A7	9.30
Duluth A7	9.30
Fostoria,O. S1	9.35
Johnstown,Pa. B2	9.30
KansasCity,Mo. S5	9.55
LosAngeles B3	10.25
Milbury,Mass.(12) N6	9.60
Minnequa,Colo. C10	9.50
Monessen,Pa. P7, P16	9.30
Muncie,Ind. I-7	9.50
Palmer,Mass.(12) W12	9.60
Pittsburg,Calif. C11	10.25
Portsmouth,O. P12	9.30
Roebling,N.J. R5	9.60
S.Chicago,Ill. R2	9.30
S.SanFrancisco C10	10.25
SparrowsPt.,Md. B2	9.40
Struthers,O. Y1	9.30
Trenton,N.J. A7	9.60
Waukegan,Ill. A7	9.30
Worcester A7, J4, T6	9.60

WIRE, Fine & Weaving(8" Coils)

Alton,Ill. L1	15.80
Bartonville,Ill. K4	15.70
Buffalo W12	15.60
Chicago W13	15.60
Cleveland A7	15.60
Crawfordsville,Ind. M8	15.70
Fostoria,O. S1	15.80
Houston S5	15.85
Jacksonville,Fla. M8	15.95
Johnstown,Pa. B2	15.60
KansasCity,Mo. S5	15.85
Kokomo,Ind. C16	15.60
Minnequa,Colo. C10	15.85
Monessen,Pa. P16	15.60
Muncie,Ind. I-7	15.80
Palmer,Mass. W12	15.90
S.SanFrancisco C10	16.45
Waukegan,Ill. A7	15.60
Worcester,Mass. A7, T6	15.90

ROPE WIRE (A)

Bartonville,Ill. K4	12.75
Buffalo W12	12.75
Fostoria,O. S1	12.75
Johnstown,Pa. B2	12.75
Monessen,Pa. P7	12.75
Muncie,Ind. I-7	12.95
Palmer,Mass. W12	13.05
Portsmouth,O. P12	12.75
Roebling,N.J. R5	13.05
St. Louis L8	12.75
SparrowsPt.,Md. B2	12.85
Struthers,O. Y1	12.75
Worcester,Mass. J4	13.05

(A) Plow and Mild Plow; add 0.25c for Improved Plow

WIRE, Tire Bead

Bartonville,Ill. K4	16.55
Monessen,Pa. P16	16.55
Roebling,N.J. R5	17.05

WIRE, Cold-Rolled Flat

Anderson,Ind. G6	11.65
Baltimore T6	11.95
Boston T6	11.95
Buffalo W12	11.65
Chicago W13	11.75
Cleveland A7	11.65
Crawfordsville,Ind. M8	11.65
Dover,O. G6	11.65
Fostoria,O. S1	11.65
FranklinPark,Ill. T6	11.75
Kokomo,Ind. C16	11.65
Massillon,O. R8	11.65
Milwaukee C23	11.85
Monessen,Pa. P7, P16	11.65
Palmer,Mass. W12	11.95
Pawtucket,R.I. N8	11.95
Philadelphia P24	11.95
Riverdale,Ill. A1	11.75
Rome,N.Y. R6	11.65
Sharon,Pa. S3	11.65
Trenton,N.J. R5	11.95
Warren,O. B9	11.65
Worcester,Mass. A7, T6	11.95

NAILS, Stock

	Colo.
AlabamaCity,Ala. R2	173
Aliquippa,Pa. J5	173
Atlanta A11	175
Bartonville,Ill. K4	175
Chicago W13	173
Cleveland A9	173
Crawfordsville,Ind. M8	175
Donora,Pa. A7	173
Duluth A7	173
Fairfield,Ala. T2	173
Houston S5	178
Jacksonville,Fla. M8	175
Johnstown,Pa. B2	173
Joliet,Ill. A7	173
KansasCity, Mo. S5	178
Kokomo,Ind. C16	175
Minnequa,Colo. C10	178
Monessen,Pa. P7	173
Pittsburg,Calif. C11	192
Rankin,Pa. A7	173
S.Chicago,Ill. R2	173
SparrowsPt.,Md. B2	175
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	179

(To Wholesalers; per cwt)

Galveston,Tex. D7	$9.10

NAILS, Cut (100 lb keg) To Dealers (33)

Conshohocken,Pa. A3	$9.80
Wheeling,W.Va. W10	9.80

POLISHED STAPLES

	Col.
AlabamaCity,Ala. R2	175
Aliquippa,Pa. J5	175
Atlanta A11	177
Bartonville,Ill. K4	177
Crawfordsville,Ind. M8	177
Donora,Pa. A7	175
Duluth A7	175
Fairfield,Ala. T2	175
Houston S5	180
Jacksonville,Fla. M8	177
Johnstown,Pa. B2	175
Joliet,Ill. A7	175
KansasCity,Mo. S5	180
Kokomo,Ind. C16	177
Minnequa,Colo. C10	180
Pittsburg,Calif. C11	194
Rankin,Pa. A7	175
S.Chicago,Ill. R2	175
SparrowsPt.,Md. B2	177
Sterling,Ill.(7) N15	175
Worcester,Mass. A7	181

TIE WIRE, Automatic Baler (14½ Ga.) (per 97 lb Net Box) Coil No. 3150

AlabamaCity,Ala. R2	$10.26
Atlanta A11	10.36
Bartonville,Ill. K4	10.36
Buffalo W12	10.26
Chicago W13	10.26
Crawfordsville,Ind. M8	10.36
Donora,Pa. A7	10.26
Duluth A7	10.26
Fairfield,Ala. T2	10.26
Houston S5	10.51
Jacksonville,Fla. M8	10.36
Johnstown,Pa. B2	10.26
Joliet,Ill. A7	10.26
KansasCity,Mo. S5	10.51
Kokomo,Ind. C16	10.36
LosAngeles B3	11.05
Minnequa,Colo. C10	10.51
Pittsburg,Calif. C11	11.04
S.Chicago,Ill. R2	10.26
S.SanFrancisco C10	11.04
SparrowsPt.,Md. B2	10.36
Sterling,Ill.(37) N15	10.36

Coil No. 6500 Stand.

AlabamaCity,Ala. R2	$10.60
Atlanta A11	10.70
Bartonville,Ill. K4	10.70
Buffalo W12	10.60
Chicago W13	10.60
Crawfordsville,Ind. M8	10.70
Donora,Pa. A7	10.60
Duluth A7	10.60
Fairfield,Ala. T2	10.60
Houston S5	10.85
Jacksonville,Fla. M8	10.70
Johnstown,Pa. B2	10.60
Joliet,Ill. A7	10.60
KansasCity,Mo. S5	10.85
Kokomo,Ind. C16	10.70
LosAngeles B3	11.40
Minnequa,Colo. C10	10.85
Pittsburg,Calif. C11	11.40
S.Chicago,Ill R2	10.60
S.SanFrancisco C10	11.40
SparrowsPt.,Md. B2	10.70
Sterling,Ill. (37) N15	10.70

Coil No. 6500 Interim

AlabamaCity,Ala. R2	$10.65
Atlanta A11	10.75
Bartonville,Ill. K4	10.75
Buffalo W12	10.65
Chicago W13	10.65
Crawfordsville,Ind. M8	10.75
Donora,Pa. A7	10.65
Duluth A7	10.65
Fairfield,Ala. T2	10.65
Houston S5	10.90
Jacksonville,Fla. M8	10.75
Johnstown,Pa. B2	10.65
Joliet,Ill. A7	10.65
KansasCity,Mo. S5	10.90
Kokomo,Ind. C16	10.75
LosAngeles B3	11.45
Minnequa,Colo. C10	10.90
Pittsburg,Calif. C11	11.45
S.Chicago,Ill. R2	10.65
S.SanFrancisco C10	11.45
SparrowsPt.,Md. B2	10.75
Sterling,Ill. (37) N15	10.75

BALE TIES, Single Loop

	Col.
AlabamaCity,Ala. R2	212
Atlanta A11	214
Bartonville,Ill. K4	214
Crawfordsville,Ind. M8	214
Donora,Pa. A7	212
Duluth A7	212
Fairfield,Ala. T2	212
Houston S5	217
Jacksonville,Fla. M8	214
Joliet,Ill. A7	212
KansasCity,Mo. S5	217
Kokomo,Ind. C16	214
Minnequa,Colo. C10	217
Pittsburg,Calif. C11	236
S.SanFrancisco C10	236
SparrowsPt.,Md. B2	214
Sterling,Ill.(7) N15	214

FENCE POSTS

Birmingham C15	172
ChicagoHts.,Ill. C2, I-2	172
Duluth A7	172
Franklin,Pa. F5	172
Huntington,W.Va. C15	172
Johnstown,Pa. B2	172
Marion,O. P11	172
Minnequa,Colo. C10	177
Sterling,Ill.(1) N15	172
Tonawanda,N.Y. B12	174

WIRE, Barbed

	Col.
AlabamaCity,Ala. R2	193**
Aliquippa,Pa. J5	190§
Atlanta A11	198*
Bartonville,Ill. K4	198
Crawfordsville,Ind. M8	198
Donora,Pa. A7	193†
Duluth A7	193†
Fairfield,Ala. T2	193†
Houston S5	198**
Jacksonville,Fla. M8	198
Johnstown,Pa. B2	196§
Joliet,Ill. A7	193†
KansasCity,Mo. S5	198**
Kokomo,Ind. C16	195†
Minnequa,Colo. C10	198**
Monessen,Pa. P7	196§
Pittsburg,Calif. C11	213†
Rankin,Pa. A7	193†
S.Chicago,Ill. R2	193**
S.SanFrancisco C10	213*
SparrowsPoint,Md. B2	198§
Sterling,Ill.(7) N15	198††

WOVEN FENCE, 9-15 Ga. Col.

Ala.City,Ala. R2	187**
Aliq'ppa,Pa.9-14½ga.J5	190§
Atlanta A11	192*
Bartonville,Ill. K4	192
Crawfordsville,Ind. M8	192
Donora,Pa. A7	187†
Duluth A7	187†
Fairfield,Ala. T2	187†
Houston S5	192**
Jacksonville,Fla. M8	192
Johnstown,Pa.(43) B2	190§
Joliet,Ill. A7	187†
KansasCity,Mo. S5	192**
Kokomo,Ind. C16	189*
Minnequa,Colo. C10	192**
Pittsburg,Calif. C11	210†
Rankin,Pa. A7	187†
S.Chicago,Ill. R2	187**
Sterling,Ill.(7) N15	192††

WIRE (16 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala.R2	17.15	18.70**
Aliq'ppa.Pa. J5	17.15	18.95
Bartonville K4	17.25	19.05
Cleveland A7	17.15	....
Craw'dsville M8	17.25	19.05
Fostoria,O. S1	17.65	19.20†
Houston S5	17.40	18.95**
Jacksonville M8	17.25	19.05
Johnstown B2	17.15	18.95§
Kan.City,Mo. S5	17.40	....
Kokomo C16	17.25	18.80†
Minnequa C10	17.40	18.95**
P'im'r,Mass.W2	17.45	19.00†
Pitts.,Calif. C11	17.50	19.05†
SparrowsPt. B2	17.25	19.05§
Sterling(37)N15	17.25	19.05††
Waukegan A7	17.15	18.70†
Worcester A7	17.45	....

WIRE, Merchant Quality

(6 to 8 gage)	An'ld Stone	Galv. Stone
Ala.City,Ala. R2	8.65	9.20**
Aliquippa J5	8.65	9.325§
Atlanta(48) A11	8.75	9.425*
Bartonville(48) K4	8.75	9.425
Buffalo W12	8.65	9.20†
Cleveland A7	8.65	....
Crawfordsville M8	8.75	9.425
Donora,Pa. A7	8.65	9.20†
Duluth A7	8.65	9.20†
Fairfield T2	8.65	9.20†
Houston(48) S5	8.90	9.45**
Jacks'ville,Fla. M8	8.75	9.425
Johnstown B2(48)	8.65	9.325§
Joliet,Ill. A7	8.65	9.20†
Kans.City(48) S5	8.90	9.45**
Kokomo C16	8.75	9.30†
LosAngeles B3	9.60	10.275§
Minnequa C10	8.90	9.45**
Monessen P7(48)	8.65	9.325§
Palmer,Mass. W12	8.95	9.50†
Pitts.Calif. C11	9.60	10.15†
Rankin,Pa. A7	8.65	9.20†
S.Chicago R2	8.65	9.20**
S.SanFran. C10	9.60	10.15**
Spar'wsPt.B2(48)	8.75	9.425§
Sterling(48) N15	8.90	9.575††
Sterling(1) (48)	8.80	9.475††
Struthers,O. Y1	8.65	9.30‡
Worcester,Mass.A7	8.95	9.50†

Based on zinc price of: *13.50. †5c. ‡10c. ‡Less than 10c. ††10.50c. **Subject to zinc equalization extras.

FASTENERS

(Base discounts, full container quantity, per cent off list, f.o.b. mill)

BOLTS

Carriage, Machine Bolts

Full Size Body (cut thread)

½ in. and smaller:	
6 in. and shorter	49.0
Longer than 6 in.	39.0
⅝ in. thru 1 in.:	
6 in. and shorter	39.0
Longer than 6 in.	35.0
1⅛ in. and larger:	
All lengths	35.0

Undersized Body (rolled thread)

½ in. and smaller:	
6 in. and shorter	49.0

Carriage, Machine, Lag Bolts

Hot Galvanized:

½ in. and smaller:	
6 in. and shorter	29.0
Longer than 6 in.	15.0
⅝ in. and larger:	
All lengths	12.0

Lag Bolts (all diam.)

6 in. and shorter	49.0
Longer than 6 in.	39.0

Plow and Tap Bolts

½ in. and smaller by 6 in. and shorter	49.0
Larger than ½ in. or longer than 6 in.	39.0

Blank Bolts 39.0

Step, Elevator, Tire Bolts 49.0

Stove Bolts, Slotted:

⅛ to ¼ in. incl., 3 in. and shorter	55.0
⅞ to ½ in., inclusive	55.0

NUTS

Reg. & Heavy Square Nuts:

All sizes	55.5

Square Nuts, Reg. & Heavy, Hot Galvanized:

All sizes	41.0

Hex Nuts, Reg. & Heavy, Hot Pressed:

¾ in. and smaller	60.5
⅞ in. to 1 in., incl.	55.5
1⅛ in. to 1½ in., incl.	58.5
1⅝ in. and larger	53.5

Hex Nuts, Reg. & Heavy, Cold Punched:

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, All Types, Hot Galvanized:

¾ in. and smaller	46.5
⅞ in. to 1 in., incl.	41.5
1⅛ in. to 1½ in., incl.	46.5

Hex Nuts, Semifinished, Heavy (Incl. Slotted):

¾ in. and smaller	60.5
⅞ in. to 1½ in., incl.	55.5
1⅝ in. and larger	53.5

Hex Nuts, Finished (Incl. Slotted and Castellated):

1 in. and smaller	63.0
1⅛ in. to 1½ in., incl.	59.0
1⅝ in. and larger	53.5

CAP AND SETSCREWS

(Base discounts, packages, per cent off list, f.o.b. mill)

Hex Head Capscrews, Coarse or Fine Thread, Bright:

6 in. and shorter:	
⅝ in. and smaller	40.0
¾, ⅞, and 1 in. diam.	22.0
Longer than 6 in.:	
⅝ in. and smaller	8.0
¾, ⅞, and 1 in. diam.	+ 6.0

High Carbon, Heat Treated:

6 in. and shorter:	
⅝ in. and smaller	26.0
¾, ⅞, and 1 in. diam.	3.0
Longer than 6 in.:	
⅝ in. and smaller	+ 13.0
¾, ⅞, and 1 in. diam.	+ 32.0

Flat Head Capscrews:

¾ in. and smaller	+ 76.0

Setscrews, Square Head, Cup Point, Coarse Thread:

Through 1 in. diam.:	
6 in. and shorter	Net
Longer than 6 in.	+ 23

RIVETS

F.o.b. Cleveland and/or freight equalized with Pittsburgh, f.o.b. Chicago and/or freight equalized with Birmingham except where equalization is too great.

Structural ½ in., larger 12.25

7/8 in. under: List less 19%

PRESTRESSED STRAND

(High strength, stress relieved; 7 wire uncoated. Net prices per 1000 ft, 40,000 lb and over)

	Strand Diameter, Inches				
	1/4	5/16	3/8	7/16	1/2
Buffalo W12	$32.15	$48.20	$61.55	$81.10	$105.65
Cleveland A7	32.15	48.20	61.55	81.10	....
KansasCity,Mo. U3	32.15	48.20	61.55	81.10	105.65
Monessen,Pa. P16	32.15	48.20	61.55	81.10	105.65
NewHaven,Conn. A7	32.15	48.20	61.55	81.10	105.65
Pittsburg,Calif. C11	....	48.20	61.55	81.10	....
Pueblo,Colo W12	32.15	48.20	61.55	81.10	105.65
Roebling,N.J. R5	32.15	48.20	61.55	81.10	105.65
St. Louis L8	32.15	48.20	61.55	81.10	105.65
Waukegan,Ill. A7	32.15	48.20	61.55	81.10	105.65

RAILWAY MATERIALS

	Standard		Tee Rails	
Rail's	No. 1	No. 2	All No. 2	60-lb Under
Bessemer,Pa. U5	5.525	5.425	....	6.50
Ensley,Ala. T2	5.525	5.425	....	6.50
Fairfield,Ala. T2	....	....	....	6.50
Gary,Ind. U5	5.525	5.425	....	....
Huntington,W.Va. C15	....	....	....	6.50
IndianaHarbor,Ind. I-2	5.525	5.425	5.475	....
Johnstown,Pa. B2	....	....	...(16)	6.50
Lackawanna,N.Y. B2	5.525	5.425	....	6.50
Minnequa,Colo. C10	5.525	5.425	....	7.00
Steelton,Pa. B2	5.525	5.425	....	....
Williamsport,Pa. S19	....	....	....	6.50

TIE PLATES

Fairfield,Ala. T2	6.60
Gary,Ind. U5	6.60
Ind.Harbor, Ind. I-2	6.60
Lackawanna,N.Y. B2	6.60
Minnequa,Colo. C10	6.60
Seattle B3	6.75
Steelton,Pa. B2	6.60
Torrance,Calif. C11	6.75

JOINT BARS

Bessemer,Pa. U5	6.975
Fairfield,Ala. T2	6.975
Ind.Harbor,Ind. I-2	6.975
Joliet,Ill. U5	6.975
Lackawanna,N.Y. B2	6.975
Minnequa,Colo. C10	6.975
Steelton,Pa. B2	6.975

AXLES

Ind.Harbor,Ind. S13	8.775
Johnstown,Pa. B2	8.775

TRACK BOLTS, Untreated

Cleveland R2	14.75
KansasCity,Mo. S5	14.75
Lebanon,Pa. B2	14.75
Minnequa,Colo. C10	14.75
Pittsburgh P14	14.75
Seattle B3	15.25

SCREW SPIKES

Lebanon,Pa. B2	14.50

STANDARD TRACK SPIKES

Fairfield,Ala. T2	9.75
Ind.Harbor,Ind. I-2, Y1	9.75
KansasCity,Mo. S5	9.75
Lebanon,Pa. B2	9.75
Minnequa,Colo. C10	9.75
Pittsburgh J5	9.75
Seattle B3	10.25
S.Chicago,Ill. R2	9.75
Struthers,O. Y1	9.75
Youngstown R2	9.75

Footnotes

(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant.
(4) Reinforcing.
(5) 1⅛ to under 1 7/16 in.; 1 7/16 to under 1 15/16 in., 6.70c; 1 15/16 to 8 in., inclusive, 7.05c.
(6) Chicago or Birm. Base.
(7) Chicago base 2 cols. lower.
(8) 16 Ga. and heavier.
(9) Merchant quality; add 0.35c for special quality.
(10) Pittsburgh base.
(11) Cleveland & Pitts. base.
(12) Worcester, Mass. base.
(13) Add 0.25c for 17 Ga. & heavier.
(14) Gage 0.143 to 0.249 in.; for gage 0.142 and lighter, 5.80c.
(15) ¾" and thinner.
(16) 40 lb and under.
(17) Flats only; 0.25 in. & heavier.
(18) To dealers.
(19) Chicago & Pitts. base.
(21) New Haven, Conn. base.
(22) Deld. San Francisco Bay area.
(23) Special quality.
(24) Deduct 0.15c, finer than 15 Ga.
(25) Bar mill bands.
(27) Bar mill sizes.
(28) Bonderized.
(29) Youngstown base.
(30) Sheared; for universal mill add 0.45c.
(31) Widths over ⅝ in.; 7.60c, for widths ⅝ in. and under by 0.125 in. and thinner.
(32) Buffalo base.
(33) To jobbers, deduct 20c.
(34) 9.60c for cut lengths.
(35) 72" and narrower.
(36) 54" and narrower.
(37) Chicago base, 10 points lower.
(38) 14 Ga. & lighter; 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.
(41) 9.10c for cut lengths.
(42) Mill lengths, f.o.b. mill; deld. in mill zone or within switching limits, 5.685c.
(43) 9-14½ Ga.
(44) To fabricators.
(48) 6-7 Ga.
(49) 3½ in. and smaller rounds; 9.30c, over 3½ in. and other shapes.

SEAMLESS STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	2		2½		3		3½		4		5		6	
List Per Ft	37c		58.5c		76.5c		92c		$1.09		$1.48		$1.92	
Pounds Per Ft	3.68		5.82		7.62		9.20		10.89		14.81		19.18	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Ambridge, Pa. N2	+9.25	....	+2.75	....	+0.25	....	1.25	....	1.25	....	1	....	3.5	....
Lorain, O. N3	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25
Youngstown Y1	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

ELECTRIC STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Youngstown R2	+9.25	+24.25	+2.75	+19.5	+0.25	+17	1.25	+15.5	1.25	+15.5	1	+15.75	3.5	+13.25

BUTTWELD STANDARD PIPE, Threaded and Coupled

Carload discounts from list, %

Size—Inches	⅛		¼		⅜		½		¾		1		1¼	
List Per Ft	5.5c		6c		6c		8.5c		11.5c		17c		23c	
Pounds Per Ft	0.24		0.42		0.57		0.85		1.13		1.68		2.28	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Alton, Ill. L1	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Benwood, W. Va. W10	4.5	+22	+7.5	+31	+18	+39.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Butler, Pa. F6	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Etna, Pa. N2	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Fairless, Pa. N3	....	....	....	....	....	....	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Fontana, Calif. K1	....	....	....	....	....	....	+8.25	+23.5	+5.25	+19.5	+1.75	+15	0.75	+14.25
Indiana Harbor, Ind. Y1	....	....	....	....	....	....	4.25	+11	7.25	+7	10.75	+2.5	13.25	+3.25
Lorain, O. N3	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sharon, Pa. S4	5.5	+21	+6.5	+30	+17	+38.5	....	....	....	....	....	....	....	....
Sharon, Pa. M6	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Sparrows Pt., Md. B2	3.5	+23	+8.5	+32	+19	+40.5	3.25	+12	6.25	+8	9.75	+3.5	12.25	+2.75
Wheatland, Pa. W9	5.5	+21	+6	+30	+17	+38.5	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75
Youngstown R2, Y1	....	....	....	....	....	....	5.25	+10	8.25	+6	11.75	+1.5	14.25	+0.75

Size—Inches	1½		2		2½		3		3½		4	
List Per Ft	27.5c		37c		58.5c		76.5c		92c		$1.09	
Pounds Per Ft	2.73		3.68		5.82		7.62		9.20		10.89	
	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*	Blk	Galv*
Aliquippa, Pa. J5	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Alton, Ill. L1	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	....	....	....	....
Benwood, W. Va. W10	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Etna, Pa. N2	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Fairless, Pa. N3	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Fontana, Calif. K1	1.25	+13.25	1.75	+12.75	3.25	+13	3.25	+13	+7.25	+24	+7.25	+24
Indiana Harbor, Ind. Y1	13.75	+0.75	14.25	+0.25	15.75	+0.5	15.25	+0.5	5.25	+11.5	5.25	+11.5
Lorain, O. N3	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sharon, Pa. M6	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	....	....	....	....
Sparrows Pt., Md. B2	12.75	+1.75	13.25	+1.25	14.75	+1.5	14.75	+1.5	4.25	+12.5	4.25	+12.5
Wheatland, Pa. W9	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5
Youngstown R2, Y1	14.75	0.25	15.25	0.75	16.75	0.5	16.75	0.5	6.25	+10.5	6.25	+10.5

*Galvanized pipe discounts based on current price of zinc (10.00c, East St. Louis).

Stainless Steel

Representative prices, cents per pound; subject to current lists of extras

AISI Type	—Rerolling— Ingot	Slabs	Forging Billets	H.R. Strip	H.R. Rods; C.F. Wire	Bars; Structural Shapes	Plates	Sheets	C.R. Strip; Flat Wire
201	22.00	27.00	....	36.00	40.00	42.00	44.25	48.50	45.00
202	23.75	30.25	36.50	39.00	40.75	43.00	45.00	49.25	49.25
301	23.25	28.00	37.25	37.25	42.00	44.25	46.25	51.25	47.50
302	25.25	31.50	38.00	40.50	42.75	45.00	47.25	52.00	52.00
302B	25.50	32.75	40.75	45.75	45.00	47.25	49.50	57.00	57.00
303	....	32.00	41.00	46.00	45.50	48.00	50.00	56.75	56.75
304	27.00	33.25	40.50	44.25	45.25	47.75	50.75	55.00	55.00
304L	....	....	48.25	51.50	53.00	55.50	58.50	63.25	62.75
305	28.50	36.75	42.50	47.50	45.25	47.75	51.25	58.75	58.75
308	30.75	38.25	47.25	50.25	52.75	55.75	60.25	63.00	63.00
309	39.75	49.50	57.75	64.50	63.75	67.00	71.00	80.50	80.50
310	49.75	61.50	78.00	84.25	86.50	91.00	92.75	96.75	96.75
314	....	....	77.50	....	86.50	91.00	92.75	99.00	104.25
316	39.75	49.50	62.25	69.25	69.25	73.00	76.75	80.75	80.75
316L	....	55.50	70.00	76.50	77.00	80.75	84.50	89.25	88.50
317	48.00	60.00	76.75	88.25	86.25	90.75	93.50	101.00	101.00
321	32.25	40.00	47.00	53.50	52.50	55.50	59.75	65.50	65.50
330	....	....	106.75	....	95.25	106.75	105.50	108.00	149.25
18-S CbTa	37.00	46.50	55.75	63.50	61.50	64.75	69.75	79.25	79.25
403	....	....	28.25	....	32.00	33.75	35.00	40.25	40.25
405	19.50	25.50	29.75	36.00	33.50	35.25	37.50	46.75	46.75
410	16.75	21.50	28.25	31.00	32.00	33.75	35.00	40.25	40.25
416	....	....	28.75	....	32.50	34.25	36.00	48.25	48.25
420	26.00	33.50	34.25	41.75	39.25	41.25	45.25	52.00	62.00
430	17.00	21.75	28.75	32.00	32.50	34.25	36.00	40.75	40.75
430F	....	....	29.50	....	33.00	34.75	36.75	51.75	42.00
431	....	28.75	37.75	....	42.00	44.25	46.00	56.00	56.00
446	....	....	39.25	59.00	44.25	46.50	47.75	70.00	70.00

Stainless Steel Producers Are: Allegheny Ludlum Steel Corp.; American Steel & Wire Div., U. S. Steel Corp.; Anchor Drawn Steel Co., division of Vanadium-Alloys Steel Co.; Armco Steel Corp.; Babcock & Wilcox Co.; Bethlehem Steel Co.; J. Bishop & Co.; A. M. Byers Co.; G. O. Carlson Inc.; Carpenter Steel Co.; Carpenter Steel Co. of New England; Charter Wire Products; Crucible Steel Co. of America; Damascus Tube Co.; Dearborn Div., Sharon Steel Corp.; Wilbur B. Driver Co.; Driver-Harris Co.; Eastern Stainless Steel Corp.; Firth Sterling Inc.; Fort Wayne Metals Inc.; Green River Steel Corp., subsidiary of Jessop Steel Co.; Indiana Steel & Wire Co.; Ingersoll Steel Div., Borg-Warner Corp.; Ellwood Ivins Steel Tube Works Inc.; Jessop Steel Co.; Johnson Steel & Wire Co. Inc.; Stainless Steel Div., Jones & Laughlin Steel Corp.; Joslyn Stainless Steels, division of Joslyn Mfg. & Supply Co.; Latrobe Steel Co.; Lukens Steel Co.; Maryland Fine & Specialty Wire Co. Inc.; McLouth Steel Corp.; Metal Forming Corp.; Midvale-Heppenstall Co.; National Standard Co.; National Tube Div., U. S. Steel Corp.; Pacific Tube Co.; Page Steel & Wire Div., American Chain & Cable Co. Inc.; Pittsburgh Rolling Mills Inc.; Republic Steel Corp.; Riverside-Alloy Metal Div., H. K. Porter Company Inc.; Rodney Metals Inc.; Sawhill Tubular Products Inc.; Sharon Steel Corp.; Simonds Saw & Steel Co.; Specialty Wire Co. Inc.; Standard Tube Co.; Superior Steel Div., Copperweld Steel Co.; Superior Tube Co.; Swepco Tube Corp.; Techalloy Co. Inc.; Timken Roller Bearing Co.; Trent Tube Co., subsidiary of Crucible Steel Co. of America; Tube Methods Inc.; Ulbrich Stainless Steels Inc.; U. S. Steel Corp.; Universal-Cyclops Steel Corp.; Vanadium-Alloys Steel Co.; Wall Tube & Metal Products Co.; Wallingford Steel Co., subsidiary of Allegheny Ludlum Steel Corp.; Washington Steel Corp.

Clad Steel

	Plates 5%	Plates Carbon Base 10%	Plates Carbon Base 15%	Plates Carbon Base 20%	Sheets Carbon Base 20%
Stainless					
302	....	....	....	....	37.50
304	34.70	37.95	42.25	46.70	39.75
304L	36.90	40.55	45.10	49.85	....
316	40.35	44.50	49.50	54.50	58.25
316L	45.05	49.35	54.70	60.10	....
316 Cb	47.30	53.80	61.45	69.10	....
321	36.60	40.05	44.60	49.30	47.25
347	38.25	42.40	47.55	52.80	57.00
405	28.60	29.85	33.35	36.85	....
410	28.15	29.55	33.10	36.70	....
430	28.30	29.80	33.55	37.25	....
Inconel	48.00	59.55	70.15	80.85	....
Nickel	41.65	51.95	62.30	72.70	....
Nickel, Low Carbon	41.95	52.60	63.30	74.15	....
Monel	43.35	53.55	63.80	74.05	....
Copper*	....	....	....	....	46.00

	Strip, Carbon Base —Cold Rolled— 10%	Both Sides
Copper*	33.10	38.75

*Deoxidized. Production points: Stainless-clad sheets, New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7, New Castle, Ind. I-4, and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; copper-clad strip, Carnegie, Pa. S18.

Tool Steel

Grade	$ per lb	Grade	$ per lb
Regular Carbon	0.305	Cr-Hot Work	0.475
Extra Carbon	0.360	W-Cr Hot Work	0.500
Special Carbon	0.475	V-Cr Hot Work	0.520
Oil Hardening	0.475	Hi-Carbon-Cr	0.925

Grade by Analysis (%) W	Cr	V	Co	Mo	$ per lb
20.25	4.25	1.6	12.25	....	4.285
18.25	4.25	1	4.75	....	2.500
18	4	2	9	....	2.870
18	4	2	....	....	1.960
18	4	1	....	....	1.795
9	3.5	..	....	....	1.395
13.5	4	3	....	....	2.060
13.75	3.75	2	5	....	2.440
6.4	4.5	1.9	....	5	1.300
6	4	3	....	6	1.545
1.5	4	1	....	8.5	1.155

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, F2, J3, L3, M14, S8, U4, V2, and V3.

Pig Iron

F.o.b. furnace prices in dollars per gross ton, as reported to STEEL. Minimum delivered prices are approximate.

	Basic	No. 2 Foundry	Malleable	Bessemer
Birmingham District				
Birmingham R2	62.00	62.50‡	....	....
Birmingham U6	....	62.50‡	66.50	....
Woodward,Ala., W15	62.00**	62.50‡	66.50	....
Cincinnati, deld.	....	70.20	....	....
Buffalo District				
Buffalo H1, R2	66.00	66.50	67.00	67.50
N.Tonawanda,N.Y., T9	....	66.50	67.00	67.50
Tonawanda,N.Y., W12	66.00	66.50	67.00	67.50
Boston, deld.	77.29	77.79	78.29	....
Rochester,N.Y., deld.	69.02	69.52	70.02	....
Syracuse,N.Y., deld.	70.12	70.62	71.12	....
Chicago District				
Chicago I-3	66.00	66.50	66.50	67.00
S.Chicago,Ill. R2	66.00	66.50	66.50	67.00
S.Chicago,Ill. W14	66.00	....	66.50	67.00
Milwaukee, deld.	69.02	69.52	69.52	70.02
Muskegon,Mich., deld.	....	74.52	74.52	....
Cleveland District				
Cleveland R2, A7	66.00	66.50	66.50	67.00
Akron,Ohio, deld.	69.52	70.02	70.02	70.52
Mid-Atlantic District				
Birdsboro,Pa. B10	68.00	68.50	69.00	69.50
Chester,Pa. P4	68.00	68.50	69.00	....
Swedeland,Pa., A3	68.00	68.50	69.00	69.50
NewYork, deld.	....	75.50	76.00	....
Newark,N.J., deld.	72.69	73.19	73.69	74.19
Philadelphia, deld.	70.41	70.91	71.41	71.99
Troy,N.Y. R2	68.00	68.50	69.00	69.50
Pittsburgh District				
NevilleIsland,Pa. P6	66.00	66.50	66.50	67.00
Pittsburgh (N&S sides), Aliquippa, deld.	....	67.95	67.95	68.48
McKeesRocks,Pa., deld.	....	67.60	67.60	68.13
Lawrenceville,Homestead, Wilmerding,Monaca,Pa., deld.	....	68.26	68.26	68.79
Verona,Trafford,Pa., deld.	68.29	68.82	68.82	69.35
Brackenridge,Pa., deld.	68.60	69.10	69.10	69.63
Midland,Pa. C18	66.00	....	....	....
Youngstown District				
Hubbard,Ohio Y1	....	....	66.50	....
Sharpsville,Pa., S6	66.00	....	66.50	67.00
Youngstown Y1	....	....	66.50	67.00
Mansfield,Ohio, deld.	71.30	....	71.80	72.30
Duluth I-3	66.00	66.50	66.50	67.00
Erie,Pa. I-3	66.00	66.50	66.50	67.00
Everett,Mass. E1	67.50	68.00	68.50	....
Fontana,Calif. K1	75.00	75.50	....	....
Geneva,Utah C11	66.00	66.50	....	....
GraniteCity,Ill. G4	67.90	68.40	68.90	....
Ironton,Utah C11	66.00	66.50	....	....
Minnequa,Colo. C10	68.00	68.50	69.00	....
Rockwood,Tenn. T3	....	62.50‡	66.50	....
Toledo,Ohio I-3	66.00	66.50	66.50	67.00
Cincinnati, deld.	72.94	73.44	....	....

**Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.
‡Phos. 0.70-0.90%; Phos. 0.30-0.69%, $63.50.

PIG IRON DIFFERENTIALS

Silicon: Add 75 cents per ton for each 0.25% Si or percentage thereof over base grade, 1.75-2.25%, except on low phos. iron on which base is 1.75-2.00%.

Manganese: Add 50 cents per ton for each 0.25% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, inclusive, add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY PIG IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1 for each 0.50% silicon or portion thereof over the base grade within a range of 6.50 to 11.50%; starting with silicon over 11.50% and $1.50 per ton for each 0.50% silicon or portion thereof up to 14%; add $1 for each 0.50% Mn over 1%)

Jackson,Ohio I-3, J1	$78.00
Buffalo H1	79.25

ELECTRIC FURNACE SILVERY IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1.25 for each 0.50% Mn over 1%; $2 per gross ton premium for 0.045% max P)

CalvertCity,Ky. P15	$99.00
NiagaraFalls, N.Y. P15	99.00
Keokuk,Iowa Open-hearth & Fdry. $9 freight allowed K2	103.50
Keokuk,Iowa O.H. & Fdry. 12½ lb piglets, 16% Si, max fr'gt allowed up to $9, K2	106.50

LOW PHOSPHORUS PIG IRON, Gross Ton

Lyles,Tenn. T3 (Phos. 0.035% max)	$78.50
Rockwood,Tenn. T3 (Phos. 0.035% max)	78.50
Troy,N.Y. R2 (Phos. 0.035% max)	74.00
Philadelphia, deld.	82.67
Cleveland A7 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Duluth I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
Erie,Pa. I-3 (Intermediate) (Phos. 0.036-0.075% max)	71.00
NevilleIsland,Pa. P6 (Intermediate) (Phos. 0.036-0.075% max)	71.00

Steel Service Center Products

Representative prices, per pound, subject to extras, f.o.b. warehouse. City delivery charges are 15 cents per 100 lb except: Denver, Moline, Norfolk, Richmond, Washington, 20 cents; Baltimore, Boston, Los Angeles, New York, Philadelphia, Portland, Spokane, San Francisco, 10 cents; Atlanta, Birmingham, Chattanooga, Houston, Seattle, no charge.

	SHEETS				STRIP	BARS			Standard Structural Shapes	PLATES	
	Hot-Rolled	Cold-Rolled	Gal. 10 Ga.†	Stainless Type 302	Hot-Rolled*	H.R. Rounds	C.F. Rds.‡	H.R. Alloy 4140††[2]		Carbon	Floor
Atlanta	8.59§	9.86§	....	....	8.64	9.01	10.68	....	9.05	8.97	10.90
Baltimore	8.00	8.90	9.68	....	8.70	8.65	12.33#	15.18	8.50	8.65	9.75
Birmingham	8.18	9.45	10.46	....	8.23	8.60	10.57	....	8.64	8.56	10.70
Boston	9.38	10.44	11.45	53.50	9.42	9.73	12.90#	15.28	9.63	9.72	11.20
Buffalo	8.25	9.00	11.07	55.98	8.50	8.80	11.00#	15.00	8.90	8.90	10.45
Chattanooga	8.35	9.69	9.65	....	8.40	8.77	10-46	....	8.88	8.80	10.66
Chicago	8.20	9.45	10.10	53.00	8.23	8.60	8.80	14.65	8.64	8.56	9.88
Cincinnati	8.34	9.48	10.10	52.43	8.54	8.92	11.06	14.86	9.18	8.93	10.21
Cleveland	8.18	9.45	10.20	52.33	8.33	8.69	10.80#	14.74	9.01	8.79	10.11
Dallas	7.50	8.80	....	....	7.65	7.60	11.01	....	7.65	8.10	9.35
Denver	9.10	11.84	12.94	....	9.43	9.80	11.19	....	9.84	9.76	11.08
Detroit	8.43	9.70	10.45	56.50	8.58	8.90	9.15	14.91	9.18	8.91	10.13
Erie, Pa.	8.20	9.45	9.95[10]	....	8.50	8.75	9.05[10]	....	9.00	8.85	10.10
Houston	7.10	8.40	8.45	54.32	7.25	7.20	11.10	13.50	7.25	7.70	8.95
Jackson, Miss.	8.52	9.79	....	....	8.57	8.94	10.68	....	8.97	8.90	10.74
Los Angeles	8.25[2]	10.30[2]	11.90[2]	57.60	8.90	8.70[2]	12.10[2]	16.10	8.50[2]	8.65[2]	10.80[2]
Memphis, Tenn.	8.55	9.80	....	....	8.60	8.97	11.96#	....	9.01	8.93	10.56
Milwaukee	8.33	9.58	10.23	....	8.36	8.73	9.03	14.78	8.85	8.69	10.01
Moline, Ill.	8.55	9.80	10.45	....	8.58	8.95	9.15	....	8.99	8.91	....
New York	8.87	10.13	10.56	53.08	9.31	9.57	12.76#	15.09	9.35	9.43	10.66
Norfolk, Va.	8.40	....	....	....	9.10	9.10	12.00	....	9.40	8.85	10.35
Philadelphia	8.00	8.90	9.92	52.69	8.70	8.65	11.51#	15.01	8.50	8.75	9.75**
Pittsburgh	8.18	9.45	10.45	52.00	8.33	8.60	10.80#	14.65	8.64	8.56	9.88
Portland, Oreg.	8.50	11.20	11.55	57.38	9.55	8.65	14.50	15.95	8.65	8.30	11.50
Richmond, Va.	8.40	....	10.40	....	9.10	9.00	....	....	9.40	8.85	10.35
St. Louis	8.54	9.79	10.36	....	8.59	8.97	9.41	15.01	9.10	8.93	10.25
St. Paul	8.79	10.04	10.71	....	8.84	9.21	9.66	....	9.38	9.30	10.49
San Francisco	9.35	10.75	11.00	55.10	9.45‡‡	9.70	13.00	16.00	9.50	9.60	12.00
Seattle	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
South'ton, Conn.	9.07	10.33	10.71	....	9.48	9.74	....	....	9.57	9.57	10.91
Spokane	9.95	11.15	12.20	57.38	10.00	10.10	14.05	16.35	9.80	9.70	12.10
Washington	8.88	....	....	....	9.36	9.56	10.94	....	9.79	9.26	10.74

*Prices do not include gage extras; †prices include gage and coating extras; ‡includes 35-cent bar quality extras; §42 in. and under; **¼ in. and heavier; ††as annealed; ‡‡¾ in. to 4 in. wide, inclusive; #1 in. round C-1018.

Base quantities, 2000 to 4999 lb except as noted; cold-rolled strip and cold-finished bars, 2000 lb and over except in Seattle, 2000 to 9999 lb; stainless sheets, 1000 lb except in Chicago, New York, Boston, Seattle, Portland, Oreg., 10,000 lb and in San Francisco, 2000 to 4999 lb; hot-rolled products on West Coast, 2000 to 9999 lb, except in Portland, Oreg., 1000 to 9999 lb; [2]—30,000 lb; [5]—1000 to 1999 lb; [10]—2000 lb and over.

Refractories

Fire Clay Brick (per 1000)

High-Heat Duty: Ashland, Grahn, Hayward, Hitchins, Haldeman, Olive Hill, Ky., Athens, Troup, Tex., Beech Creek, Clearfield, Curwensville, Lock Haven, Lumber, Orviston, West Decatur, Winburne, Snow Shoe, Pa., Bessemer, Ala., Farber, Mexico, St. Louis, Vandalia, Mo., Ironton, Oak Hill, Parrall, Portsmouth, Ohio, Ottawa, Ill., Stevens Pottery, Ga., $135; Salina, Pa., $140; Niles, Ohio, $138; Cutler, Utah, $165.

Super-Duty: Ironton, Ohio, Vandalia, Mo., Olive Hill, Ky., Clearfield, Salina, Winburne, Snow Shoe, Pa., New Savage, Md., St. Louis, $175; Stevens Pottery, Ga., $185; Cutler, Utah, $233.

Silica Brick (per 1000)

Standard: Alexandria, Claysburg, Mt. Union, Sproul, Pa., Ensley, Ala., Pt. Matilda, Pa., Portsmouth, Ohio, Hawstone, Pa., $150; Warren, Niles, Windham, Ohio, Hays, Latrobe, Morrisville, Pa., $155; E. Chicago, Ind., Joliet, Rockdale, Ill., $160; Lehigh, Utah, $175; Los Angeles, $180.

Super-Duty: Sproul, Hawstone, Pa., Niles, Warren, Windham, Ohio, Leslie, Md., Athens, Tex., $157; Morrisville, Hays, Latrobe, Pa., $160; E. Chicago, Ind., $167; Curtner, Calif., $182.

Semisilica Brick (per 1000)

Clearfield, Pa., $140; Philadelphia, $137; Woodbridge, N. J., $135.

Ladle Brick (per 1000)

Dry Pressed: Alsey, Ill., Chester, New Cumberland, W. Va., Freeport, Johnstown, Merrill Station, Vanport, Pa., Mexico, Vandalia, Mo., Wellsville, Irondale, New Salisbury, Ohio, $96.75; Clearfield, Pa., Portsmouth, Ohio, $102.

High-Alumina Brick (per 1000)

50 Per Cent: St. Louis, Mexico, Vandalia, Mo., $235; Danville, Ill., $238; Philadelphia, Clearfield, Pa., $230; Orviston, Snow Shoe, Pa., $245.

60 Per Cent: St. Louis, Mexico, Vandalia, Mo., $295; Danville, Ill., $298; Clearfield, Orviston, Snow Shoe, Pa., $305; Philadelphia, $310.

70 Per Cent: St .Louis, Mexico, Vandalia, Mo., $335; Danville, Ill., $338; Clearfield, Orviston, Snow Shoe, Pa., $345; Philadelphia, $350.

Sleeves (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $188.

Nozzles (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., St. Louis, $310.

Runners (per 1000)

Reesdale, Johnstown, Bridgeburg, Pa., $234.

Dolomite (per net ton)

Domestic, dead-burned, bulk, Billmeyer, Blue Bell, Williams, Plymouth Meeting, York, Pa., Millville, W. Va., Bettsville, Millersville, Martin, Woodville, Gibsonburg, Narlo, Ohio, $16.75; Thornton, McCook, Ill., $17; Dolly Siding, Bonne Terre, Mo., $15.

Magnesite (per net ton)

Domestic, dead-burned, ½ in. grains with fines: Chewelah, Wash., Luning, Nev., $16; ⅜ in. grains with fines: Baltimore, $73.

Fluorspar

Metallurgical grades, f.o.b. shipping point in Ill., Ky., net tons, carloads, effective CaF_2 content 72.5%, $37-$41; 70%, $36-$40; 60%, $33-$36.50. Imported, net tons, f.o.b. cars point of entry, duty paid, metallurgical grade: European, $30-$33, contract; Mexican, all rail, duty paid, $25; barge, Brownsville, Tex., $27.

Ores

Lake Superior Iron Ore

(Prices effective for the 1958 shipping season, gross ton, 51.50% iron natural, rail of vessel, lower lake ports.)

Mesabi bessemer	$11.60
Mesabi nonbessemer	11.45
Old Range bessemer	11.85
Old Range nonbessemer	11.70
Open-hearth lump	12.70
High phos	11.45

The foregoing prices are based on upper lake rail freight rates, lake vessel freight rates, handling and unloading charges, and taxes thereon, which were in effect Jan. 30 1957, and increases or decreases after that date are absorbed by the seller.

Eastern Local Iron Ore

Cents per unit, deld. E Pa.

New Jersey, foundry and basic 62-64% concentrates	*18.00-19.00*

Foreign Iron Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 65%	25.00
N. African hematite (spot)	nom.
Brazilian iron ore, 68.5%*	14.60

Tungsten Ore

Net ton, unit

Foreign wolframite, good commercial quality	$9.50-10.00
Domestic, concentrates f.o.b. milling points	17.00-22.00

*Before duty.

Manganese Ore

Mn 46-48%, Indian (export tax included), $1.25 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; other than Indian, nominal; contracts by negotiation.

Chrome Ore

Gross ton, f.o.b. cars New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., Tacoma, Wash.

Indian and Rhodesian	
48% 3:1	$46.00-48.00
48% 2.8:1	42.00-44.00
48% no ratio	32.00-34.00
South African Transvaal	
48% no ratio	$32.00-34.00
44% no ratio	24.00-25.00
Turkish	
48% 3:1	$51.00-55.00
Domestic	
Rail nearest seller	
18% 3:1	$39.00

Molybdenum

Sulfide concentrate, per lb of Mo content, mines, unpacked	$1.23

Antimony Ore

Per short ton unit of Sb content, c.i.f. seaboard

50-55%	$2.25-2.40
60-65%	2.50-3.10

Vanadium Ore

Cents per lb V_2O_5

Domestic	31.00

Metal Powder

(Per pound f.o.b. shipping point in ton lots for minus 100 mesh, except as noted)

	Cents
Sponge Iron, Swedish: deld. east of Mississippi River, ocean bags 23,000 lb and over..	10.50
F.o.b. Riverton or Camden, N. J., west of Mississippi River.	9.50
Sponge Iron, Dometic, 98 + % Fe: Deld. east of Mississippi River, 23,000 lb and over	10.50
Electrolytic Iron: Melting stock, 99.9% Fe, irregular fragments of ⅛ in. x 1.3 in.	28.00
Annealed, 99.5% Fe..	36.50
Unannealed (99 + % Fe)	36.00
Unannealed (99 + % Fe) (minus 325 mesh)	59.00
Powder Flakes (minus 16, plus 100 mesh)	29.00
Carbonyl Iron: 98.1-99.9%, 3 to 20 microns, depending on grade, 93.00-250.00 in standard 200-lb containers; all minus 200 mesh.	

Aluminum: Atomized, 500-lb drum, freight allowed	
Carlots	39.50
Ton lots	41.50
Antimony, 500-lb lots	42.00*
Brass, 5000-lb lots	*31.00-46.70‡*
Bronze, 5000-lb lots	*47.20-51.50‡*
Copper:	
Electrolytic	14.75*
Reduced	14.75*
Lead	7.50*
Manganese:	
Minus 35 mesh	64.00
Minus 100 mesh	70.00
Minus 200 mesh	75.00
Nickel, unannealed	74.00
Nickel-Silver, 5000-lb lots	*48.80-53.50‡*
Phosphor-Copper, 5000-lb lots	*59.30*
Copper (atomized) 500-lb lots	*39.80-48.30‡*
Silicon	47.50
Solder	7.00*
Stainless Steel, 304	$1.07
Stainless Steel, 316	$1.26
Tin	14.50*
Zinc, 5000-lb lots	17.50-30.70‡
Tungsten:	Dollars
Melting grade, 99% 60 to 200 mesh, nominal;	3.15
1000 lb and over	3.15
Less than 1000 lb	3.30
Chromium, electrolytic 99.8% Cr min metallic basis	5.00

*Plus cost of metal. †Depending on composition. ‡Depending on mesh.

Electrodes

Threaded with nipple; unboxed, f.o.b. plant

GRAPHITE

Inches Diam	Inches Length	Per 100 lb
2	24	$60.75
2½	30	39.25
3	40	37.00
4	40	35.00
5½	40	34.75
6	60	31.50
7	60	28.25
8, 9, 10	60	28.00
12	72	26.75
14	60	26.75
16	72	25.75
17	60	26.25
18	72	26.25
20	72	25.25
24	84	26.00

CARBON

8	60	13.30
10	60	13.00
12	60	12.95
14	60	12.85
14	72	11.95
17	60	11.85
17	72	11.40
20	84	11.40
20	90	11.00
24	72, 84	11.25
24	96	10.95
30	84	11.05
40, 35	110	10.70
40	100	10.70

Imported Steel

(Base per 100 lb, landed, duty paid, based on current ocean rates. Any increase in these rates is for buyer's account. Source of shipment: Western continental European countries.)

	North Atlantic	South Atlantic	Gulf Coast	West Coast
Deformed Bars, Intermediate, ASTM-A 305	$5.30	$5.30	$5.30	$5.50
Bar Size Angles	5.05	5.05	5.05	5.42
Structural Angles	5.05	5.05	5.05	5.42
I-Beams	5.11	5.11	5.11	5.45
Channels	5.11	5.11	5.11	5.45
Plates (basic bessemer)	6.62	6.62	6.62	6.94
Sheets, H.R.	8.20	8.20	8.20	8.50
Sheets, C.R. (drawing quality)	8.75	8.75	8.75	9.12
Furring Channels, C.R., 1000 ft, ¾ x 0.30 lb per ft	25.71	25.59	25.59	26.46
Barbed Wire (†)	6.65	6.65	6.65	7.00
Merchant Bars	6.07	6.07	6.07	6.43
Hot-Rolled Bands	7.15	7.15	7.15	7.55
Wire Rods, Thomas Commercial No. 5	*6.50*	*6.50*	*6.50*	*6.90*
Wire Rods, O.H. Cold Heading Quality No. 5	7.07	7.07	7.07	7.47
Bright Common Wire Nails (§)	8.02	8.02	7.92	8.20

†Per 82 lb net reel. §Per 100-lb kegs, 20d nails and heavier.

Metallurgical Coke

Price per net ton

Beehive Ovens

Connellsville, Pa. furnace	$14.75-15.75
Connellsville, Pa., foundry	18.00-18.50

Oven Foundry Coke

Birmingham, ovens	$28.85
Cincinnati, deld.	31.84
Buffalo, ovens	30.50
Camden, N. J., ovens	29.50
Detroit, ovens	30.50
Pontiac, Mich., deld.	32.45
Saginaw, Mich., deld.	34.03
Erie, Pa., ovens	30.50
Everett, Mass., ovens: New England, deld.	31.55*
Indianapolis, ovens	29.75
Ironton, Ohio, ovens	29.00
Cincinnati, deld.	31.84
Kearny, N. J., ovens	29.75
Milwaukee, ovens	30.50
Neville Island (Pittsburgh), Pa., ovens	29.25
Painesville, Ohio, ovens	30.50
Cleveland, deld.	32.69
Philadelphia, ovens	29.50
St. Louis, ovens	31.50
St. Paul, ovens	29.75
Chicago, deld.	33.29
Swedeland, Pa., ovens	29.50
Terre Haute, Ind., ovens	29.75

*Or within $4.85 freight zone from works.

Coal Chemicals

Spot, cents per gallon, ovens

Pure benzene	36.00
Toluene, one deg	29.50
Industrial xylene	32.00-34.00

Per ton, bulk, ovens

Ammonium sulfate	$32.00-34.00

Cents per pound, producing point

Phenol: Grade 1, 17.50; Grade 2-3, 15.50; Grade 4, 17.50; Grade 5, 16.50; Grade 6, 14.50.

Ferroalloys

MANGANESE ALLOYS

Spiegeleisen: Carlot, per gross ton, Palmerton, Neville Island, Pa. 21-23% Mn, $105; 19-21% Mn, 1-3% Si, $102.50; 16-19% Mn, $100.50.

Standard Ferromanganese: (Mn 74-76%, C 7% approx) base price per net ton, $245, Johnstown, Duquesne, Sheridan, Neville Island, Pa.; Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Add or subtract $2 for each 1% or fraction thereof of contained manganese over 76% or under 74%, respectively. (Mn 79-81%). Lump $253 per net ton, f.o.b. Anaconda or Great Falls, Mont. Add $2.60 for each 1% above 81%; subtract $2.60 for each 1% below 79%, fractions in proportion to nearest 0.1%.

High-Grade Low-Carbon Ferromanganese: (Mn 85-90%). Carload, lump, bulk, max 0.07% C, 35.1c per lb of contained Mn, carload packed 36.4c, ton lots 37.9c, less ton 39.1c. Delivered. Deduct 1.5c for max 0.15% C grade from above prices, 3c for max 0.03% C, 3.5c for max 0.5% C, and 6.5c for max 75% C—max 7% Si. **Special Grade:** (Mn 90% min, C 0.07% max, P 0.06% max). Add 2.05c to the above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.25-1.5%, Si 1.5% max). Carload, lump, bulk, 25.5c per lb of contained Mn, packed, carload 26.8c, ton lot 28.4c, less ton 29.6c. Delivered. Spot, add 0.25c.

Manganese Metal: 2" x D (Mn 95.5% min, Fe 2% max, Si 1% max, C 0.2%). Carload, lump, bulk, 45c per lb of metal; packed, 45.75c; ton lot 47.25c; less ton lot 49.25c. Delivered. Spot, add 2c.

Electrolytic Manganese Metal: Min carload, 34c; 2000 lb to min carload, 36c; less ton, 38c; 50 lb cans, add 0.5c per lb. Premium for hydrogen-removed metal, 0.75c per lb. Prices are f.o.b. cars, Knoxville, Tenn., freight allowed to St. Louis or any point east of Mississippi; or f.o.b. Marietta, O., freight allowed.

Silicomanganese: (Mn 65-68%). Carload, lump, bulk 1.50% C grade, 18-20% Si, 12.8c per lb of alloy. Packed, c.l. 14c, ton 14.45c, less ton 15.45c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. For 2% C grade, Si 15-17%, deduct 0.2% from above prices. For 3% C grade Si 12-14.5%, deduct 0.4c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max, Si 4 % max, C 0.10% max). Contract, ton lot, 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max, Si 4% max, C 0.10% max). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $200 per ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi River and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%). Contract $225 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

CHROMIUM ALLOYS

High-Carbon Ferrochrome: Contract, c.l. lump, bulk 28.75c per lb of contained Cr; c.l. packed 30.30c, ton lot 32.05c; less ton 33.45c. Delivered. Spot, add 0.25c.

Low-Carbon Ferrochrome: Cr 63-66% (Simplex), carload, lump, bulk, C 0.025% max, 36.75c per lb contained Cr; 0.010% max, 37.75c. Ton lot, add 3.5c; less ton, add 5.2c. Delivered.

Cr 67-71%, carload, lump, bulk, C 0.02% max, 41.00c per lb contained Cr; 0.025% max, 39.75c; 0.05% max, 39.00c; 0.10% max, 38.50c; 0.20% max, 38.25c; 0.50% max, 38.00; 1.0% max, 37.75c; 1.5% max, 37.50c; 2.0% max, 37.25c. Ton lot, add 3.4c; less ton lot, add 5.1c. Delivered.

Foundry Ferrochrome, High-Carbon: (Cr 61-66%, C 5-7%, Si 7-10%). Contract, c.l., 2 in. x D, bulk 30.05c per lb of contained Cr. Packed, c.l. 31.65c, ton 33.45c, less ton 34.95c. Delivered. Spot, add 0.25c.

Foundry Ferrosilicon Chrome: (Cr 50-54%, Si 28-32%, C 1.25% max). Contract, carload packed, SM x D, 21.25c per lb of alloy, ton lot 22.50c; less ton lot 23.70c. Delivered. Spot, add 0.25c.

Ferrochrome-Silicon: Cr 39-41%, Si 42-45%, C 0.05% max or Cr 33-36%, Si 45-48%, C 0.05% max. Carload, lump, bulk, 3" x down and 2" x down, 27.50c per lb contained Cr, 14.20c per lb contained Si. 0.75" x down, 28.65c per lb contained Cr, 14.20c per lb contained Si. Delivered.

Chromium Metal Electrolytic: Commercial grade (Cr 99.8% min, metallic basis, Fe 0.2% max). Contract carlot, packed 2" x D plate (about ⅛" thick) $1.29 per lb, ton lot $1.31, less ton lot $1.33. Delivered. Spot, add 5c.

VANADIUM ALLOYS

Ferrovanadium: Open-hearth grade (V 50-55%, Si 8% max, C 3% max). Contract, any quantity, $3.20 per lb of contained V. Delivered. Spot, add 10c. **Special Grade:** (V 50-55% or 70-75%, Si 2% max, C 0.5% max) $3.30. **High Speed Grade:** (V 50-55%, or 70-75%, Si 1.50% max, C 0.20% max) $3.40.

Grainal: Vanadium Grainal No. 1 $1.05 per lb; No. 79, 50c, freight allowed.

Vanadium Oxide: Contract less carload lot, packed, $1.38 per lb contained V_2O_5, freight allowed. Spot, add 5c.

SILICON ALLOYS

50% Ferrosilicon: Contract, carload, lump, bulk, 14.20c per lb of contained Si. Packed c.l. 16.70c, ton lot 18.15c, less ton 19.80c, f.o.b. Alloy, W. Va.; Ashtabula, Marietta, O.; Sheffield, Ala.; Portland, Oreg. Spot, add 0.45c.

Low-Aluminum 50% Ferrosilicon: (Al 0.40% max). Add 1.45c to 50% ferrosilicon prices.

65% Ferrosilicon: Contract, carload, lump, bulk, 15.25c per lb contained silicon. Packed, c.l. 17.25c, ton lot 19.05c, less ton 20.4c. Delivered. Spot, add 0.35c.

75% Ferrosilicon: Contract, carload, lump, bulk, 16.4c per lb of contained Si. Packed, c.l. 18.30c, ton lot 19.95c, less ton 21.2c. Delivered. Spot, add 0.3c.

90% Ferrosilicon: Contract, carload, lump, bulk, 19.5c per lb of contained Si. Packed, c.l. 21.15c, ton lot 22.55c, less ton 23.6c. Delivered. Spot, add 0.25c.

Silicon Metal: (98% min Si, 0.75% max Fe, 0.07% max Ca), C.l. lump, bulk, 22.00c per lb of Si. Packed, c.l. 23.65c, ton lot 24.95c, less ton 25.95c. Add 0.5c for max 0.03% Ca grade. Deduct 0.5c, for max 1% Fe grade analyzing min 99.75% Si; 0.75c for max 1.25% Fe grades analyzing min 96.75% Si. Spot, add 0.25c.

Alsifer: (Approx 20% Al, 40% Si, 40% Fe). Contract, basis f.o.b. Niagara Falls, N. Y., lump, carload, bulk, 10.65c per lb of alloy; ton lot, packed, 11.8c.

ZIRCONIUM ALLOYS

12-15% Zirconium Alloy: (Zr 12-15%, Si 39-43%, C 0.20% max). Contract, c.l. lump, bulk 9.25c per lb of alloy. Packed, c.l. 10.45c, ton lot 11.6c, less ton 12.45c. Delivered. Spot, add 0.25c.

35-40% Zirconium Alloy: (Zr 35-40%, Si 47-52%, Fe 8-12%, C 0.50% max). Contract, carload, lump, packed 27.25c per lb of alloy, ton lot 28.4c, less ton 29.65c. Freight allowed. Spot, add 0.25c.

BORON ALLOYS

Ferroboron: (B 17.50% min, Si 1.50% max, Al 0.50% max, C 0.50% max). Contract, 100 lb or more 1" x D, $1.20 per lb of alloy; less than 100 lb $1.30. Delivered. Spot, add 5c. F.o.b. Washington, Pa., prices, 100 lb and over are as follows: Grade A (10-14% B) 85c per lb; Grade B (14-18% B) $1.20; Grade C (19% min B) $1.50.

Borosil: (3 to 4% B, 40 to 45% Si). Carload, bulk, lump, or 3" x D, $5.25 per lb of contained B. Packed, carload $5.40, ton to c.l. $5.50, less ton $5.60. Delivered.

Bortam: (B 1.5-1.9%). Ton lot, 45c per lb; less than ton lot, 50c per lb.

Carbortam: (B 1 to 2%). Contract, lump, carload 9.50c per lb f.o.b. Suspension Bridge, N. Y., freight allowed same as high-carbon ferrotitanium.

CALCIUM ALLOYS

Calcium-Manganese-Silicon: (Ca 16-20%, Mn 14-18% and Si 53-59%). Contract, carload, lump, bulk 23c per lb of alloy, carload packed 24.25c, ton lot 26.15c, less ton 27.15c. Delivered. Spot, add 0.25c.

Calcium-Silicon: (Ca 30-33%, Si 60-65%, Fe 1.5-3%). Contract, carload, lump, bulk 24c per lb of alloy, carload packed 25.65c, ton lot 27.95c, less ton 29.45c. Delivered. Spot, add 0.25c.

BRIQUETTED ALLOYS

Chromium Briquets: (Weighing approx 3⅝ lb each and containing 2 lb of Cr). Contract, carload, bulk 19.60c per lb of briquet, carload packed in box pallets 19.80c, in bags 20.70c; 3000 lb to c.l. in box pallets 21.00c; 2000 lb to c.l. in bags 21.90c; less than 2000 lb in bags 22.80c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Ferromanganese Briquets: (Weighing approx 3 lb and containing 2 lb of Mn). Contract, carload, bulk 14.8c per lb of briquet; c.l., packed, pallets 15c, bags 16c; 3000 lb to c.l., pallets 16.2c; 2000 lb to c.l., bags, 17.2c; less ton 18.1c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicomanganese Briquets: (Weighing approx 3½ lb and containing 2 lb of Mn and approx ½ lb of Si). Contract, c.l. bulk 15.1c per lb of briquet; c.l. packed, pallets, 15.3c; bags 16.3c, 3000 lb to c.l., pallets, 16.5c; 2000 lb to c.l., bags 17.5c; less ton 18.4c. Delivered. Add 0.25c for notching. Spot, add 0.25c.

Silicon Briquets: (Large size—weighing approx 5 lb and containing 2 lb of Si). Contract, carload, bulk 7.7c per lb of briquet; packed, pallets, 7.9c; bags 8.9c; 3000 lb to c.l., pallets 9.5c; 2000 lb to c.l., bags 10.5c; less ton 11.4c. Delivered. Spot, add 0.25c. (Small size—weighing approx 2½ lb and containing 1 lb of Si). Carload, bulk 7.85c. Packed, pallets 8.05c; bags 9.05c; 3000 lb to c.l., pallets 9.65c; 2000 lb to c.l., bags, 10.65c; less ton 11.55c. Delivered. Add 0.25c for notching, small size only. Spot, add 0.25c.

Molybdic-Oxide Briquets: (Containing 2½ lb of Mo each). $1.41 per pound of Mo contained, f.o.b. Langeloth, Pa.

TUNGSTEN ALLOYS

Ferrotungsten: (70-80%), 5000 lb W or more $2.15 per lb (nominal) of contained W. Delivered.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 50-60%, Si 8 % max, C 0.4% max). Ton lots 2" x D, $4 per lb of contained Cb; less ton lots, $4.05 (nominal). Delivered.

Ferrotantalum Columbium: (Cb 40% approx, Ta 20% approx, and Cb plus Ta 60% min, C 0.30% max). Ton lot 2" x D, $3.80 per lb of contained Cb plus Ta, delivered; less ton lot $3.85 (nominal).

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx). Contract, c.l. packed ½-in. x 12 M 20.00c per lb of alloy, ton lot 21.15c, less ton 22.40c. Delivered. Spot, add 0.25c.

Graphidox No. 5: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 19c per lb of alloy, ton lot 20.15c; less ton lot 21.4c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed 18.1c per lb of alloy; ton lot 19.55c; less ton lot 20.8c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

Simanal: (Approx 20% each Si, Mn, Al; bal Fe). Lump, carload, bulk 18.50c. Packed c.l. 19.50c, 2000 lb to c.l. 20.50c; less than 2000 lb 21c per lb of alloy. Delivered.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $5 for each 1% of P above or below the base); carload, bulk, f.o.b. sellers' works, Mt. Pleasant, Siglo, Tenn., $120 per gross ton.

Ferromolybdenum: (55-75%). Per lb of contained Mo, in 200-lb container, f.o.b. Langeloth and Washington, Pa. $1.68 in all sizes except powdered which is $1.74.

Technical Molybdic-Oxide: Per lb of contained Mo, in cans, $1.39; in bags, $1.38, f.o.b. Langeloth and Washington, Pa.

J. E. Loudon, of Cone Co. and COMAPRO Director, and Charles L. Kent of J&L, observe machining of spark plug shells from J&L $13/16$" cold finished hexagons used in initial tests.

First COMAPRO tests prove fine machinability of J&L TYPE A LEADED STEEL

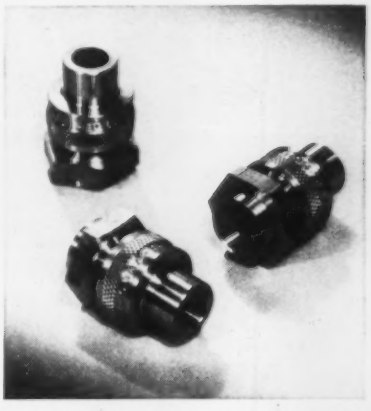
Spark plug shell production time cut 30%

Full utilization of the free-cutting capacity of J&L's Type A leaded steel was a key factor in the production increases reported during the first series of tests in the Cone Automatic Machine Company cooperative machining project known as COMAPRO. The conventional index time on a spark plug shell of about 6.5 seconds per unit was reduced to 4.41 seconds—approximately 30%—and the free machining quality of J&L leaded steel reduced time-consuming delays for tool changes.

The use of Type A leaded steel is spreading rapidly because of its superior machinability and machined finish. In actual production, the use of J&L's Type A leaded steel has increased overall production rates by 22%, reduced tool costs by 50%, and has required less power than making similar parts of conventional steel.

Jones & Laughlin was selected by the Cone Automatic Machine Co., Inc., Windsor, Vt., to be a co-sponsor of the COMAPRO cost-and-procedures analysis and to supply its Type A leaded steel bar stock in $13/16$-inch cold finished hexagons for the first series of tests. The aim of this project is to develop more efficient methods of machining steel and to uncover wasteful machine shop practices. Data assembled under closely controlled conditions should eventually permit the development of optimum production set-ups for machining standard steel products at the lowest unit cost.

This new metal-working cost analysis project represents an important step forward in applied research. Jones & Laughlin, the *modern* steel company, is proud to be one of its co-sponsors.



SPARK PLUG SHELLS were selected as typical machined parts for first series of COMAPRO tests. The illustrated superior finish and 30% savings in unit production time are attributable in large part to the use of J&L's Type A leaded steel.

Jones & Laughlin Steel Corporation

PITTSBURGH, PENNSYLVANIA

FREE GIANT SAW CHART

GIVES SAW MAINTENANCE AND CUTTING TIPS ON COLD CUTTING OF METAL

If you use segmental circular cold saws to cut metal, you need this chart. It's designed for quick and easy reference when saw problems occur. The chart measures 20½" x 14½" and is mounted on heavy cardboard suitable for hanging on wall or machine. It is divided into four major sections listing common cutting problems and their solution. It is prepared by the world-famous Firth Brown Tools, Ltd., of Sheffield, England, manufacturers of Insto Segmental Saws — THE SAW THAT COSTS LESS NEW THAN RESEGMENTING OLD BLADES.

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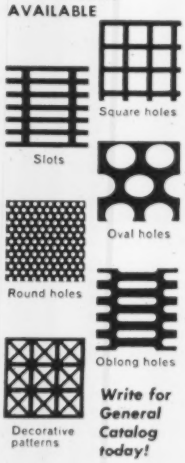

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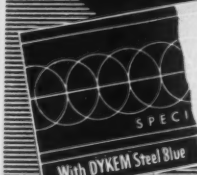

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Scrap Advancing with Steel Rate

Mill buying is restricted, but broker inquiry gains and dealers' market position is strengthened by rising ingot operations. STEEL's index at $36.67 is up another 84 cents a ton

Scrap Prices, Page 168

Chicago—The local scrap market is strengthening following last week's pushup of $1 a ton. The same grades have advanced another $1 on the strength of broker buying and have carried everything except the foundry items with them to the extent of $1 to $2 a ton.

There is some doubt the mills could buy, at least in volume, at currently listed quotations. Reasons: 1. Scrap generation is off because of vacation closings of metalworking plants. 2. Dealers aren't anxious to sell, thinking the market will rise more on the prospects of much higher steelmaking operations in the closing months of this year.

Pittsburgh—Scrap prices are holding up better than had been expected. Brokers look for a gradual improvement, but there have been no representative transactions between mills and brokers. Brokers are making more inquiries for material, and dealers are encouraged by this renewed interest even though they are not being offered any more for scrap than they received last month. Some think the Middle East trouble may strengthen the market.

On the basis of local mill purchases, No. 1 heavy melting remains at $35-$36. If a consumer sought to buy 5000 tons, the price undoubtedly would be higher. The Pennsylvania Railroad sold 500 tons of heavy melting at $43.25, but it's thought brokers paid that price to protect their investment in material on hand. Steel wheels sold higher ($48.50) on speculation, but rail crops, angles, and splice bars declined.

New York—Brokers have advanced their buying prices on No. 1 heavy melting and No. 1 bundles to $30-$31, and on No. 2 heavy melting to $27. They say little scrap is coming into yards, and that situation, combined with a stiffening in foreign demand, has strengthened the market on the major open hearth grades. Other grades are unchanged.

Spain has closed on about 85,000 tons of No. 1 and No. 2 heavy melting for shipment over the next four months. Inquiry from other European areas is reported quickening.

Philadelphia — Prices on No. 1 heavy melting, No. 1 bundles, and No. 1 busheling have been advanced $1 a ton on relatively small sales and are now quoted $35, delivered. Similarly, No. 2 heavy melting advanced to $31.

Boston—Shipments to district and eastern Pennsylvania consuming points are light. The steelmaking grades are dragging bottom. The cast iron grades are also slow, foundries paying $40-$42, delivered, for No. 1 machinery cast. Consumers insist on top quality material at that price.

Lower freight rates, Portland, Maine, from Bangor, Bath and other Maine origin points, have been posted in lieu of former mileage commodity rates.

Cleveland—Despite the absence of active demand, the market tone is stronger. Prices are unchanged on the basis of last sales in the Valley at $38-$39 for No. 1 heavy melting steel. Should steelmaking operations continue to rise (the Cleveland area ingot rate went up 11 points last week to 48.5 per cent) scrap would quickly go up a couple dollars a ton, say observers. Auto lists are expected to bring higher prices at the end of the month.

(*Please turn to Page 173*)

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Iron and Steel Scrap

Consumer prices per gross ton, except as otherwise noted, including brokers' commission, as reported to STEEL, July 16, 1958. *Changes shown in italics.*

STEELMAKING SCRAP COMPOSITE

July 16	$36.67
July 9	35.83*
June Avg.	35.50
July 1957	54.67
July 1953	43.51

Based on No. 1 heavy melting grade at Pittsburgh, Chicago, and eastern Pennsylvania.

*Revised

PITTSBURGH

No. 1 heavy melting	35.00-36.00
No. 2 heavy melting	30.00-31.00
No. 1 dealer bundles	35.00-36.00
No. 2 bundles	*26.00-27.00*
No. 1 busheling	**35.00-36.00**
No. 1 factory bundles	40.00-41.00
Machine shop turnings	15.00-16.00
Mixed borings, turnings	15.00-16.00
Short shovel turnings	19.00-20.00
Cast iron borings	19.00-20.00
Cut structurals:	
2 ft and under	39.00-40.00
3 ft lengths	37.00-38.00
Heavy turnings	31.00-32.00
Punchings & plate scrap	40.00-41.00
Electric furnace bundles	40.00-41.00

Cast Iron Grades

No. 1 cupola	39.00-40.00
Stove plate	**39.00-40.00**
Unstripped motor blocks	23.00-24.00
Clean auto cast	39.00-40.00
Drop broken machinery	48.00-49.00

Railroad Scrap

No. 1 R.R. heavy melt.	*42.00-43.00*
Rails, 2 ft and under	53.00-54.00
Rails, 18 in. and under	54.00-55.00
Random rails	50.00-51.00
Railroad specialties	*47.00-48.00*
Angles, splice bars	**44.00-45.00**
Rails, rerolling	58.00-60.00

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	100.00-105.00
430 bundles & solids	100.00-105.00
430 turnings	50.00-52.00

CHICAGO

No. 1 hvy melt., indus.	*40.00-41.00*
No. 1 hvy melt., dealer	*38.00-39.00*
No. 2 heavy melting	*35.00-36.00*
No. 1 factory bundles	*44.00-45.00*
No. 1 dealer bundles	*39.00-40.00*
No. 2 bundles	28.00-29.00
No. 1 busheling, indus.	*40.00-41.00*
No. 1 busheling, dealer	*38.00-39.00*
Machine shop turnings	*20.00-21.00*
Mixed borings, turnings	*22.00-23.00*
Short shovel turnings	*22.00-23.00*
Cast iron borings	*22.00-23.00*
Cut structurals, 3 ft	43.00-44.00
Punchings & plate scrap	44.00-45.00

Cast Iron Grades

No. 1 cupola	41.00-42.00
Stove plate	39.00-40.00
Unstripped motor blocks	34.00-35.00
Clean auto cast	47.00-48.00
Drop broken machinery	47.00-48.00

Railroad Scrap

No. 1 R.R. heavy melt.	*43.00-44.00*
R.R. malleable	*54.00-55.00*
Rails, 2 ft and under	*55.00-56.00*
Rails, 18 in. and under	*55.00-57.00*
Angles, splice bars	*50.00-51.00*
Axles	*62.00-63.00*
Rails, rerolling	*57.00-58.00*

Stainless Steel Scrap

18-8 bundles & solids	180.00-185.00
18-8 turnings	95.00-100.00
430 bundles & solids	95.00-100.00
430 turnings	50.00-55.00

YOUNGSTOWN

No. 1 heavy melting	38.50-39.00
No. 2 heavy melting	*27.00-28.00*
No. 1 busheling	38.00-39.00
No. 1 bundles	38.00-39.00
No. 2 bundles	*24.00-25.00*
Machine shop turnings	*12.00-13.00*
Short shovel turnings	*17.00-18.00*
Cast iron borings	*17.00-18.00*
Low phos.	*37.00-38.00*
Electric furnace bundles	39.0040.00

Railroad Scrap

No. 1 R.R. heavy melt.	41.00-42.00

CLEVELAND

No. 1 heavy melting	34.50-35.50
No. 2 heavy melting	*24.00-25.00*
No. 1 factory bundles	38.00-39.00
No. 1 bundles	34.50-35.50
No. 2 bundles	20.00-21.00
No. 1 busheling	34.50-35.50
Machine shop turnings	*9.00-10.00*
Short shovel turnings	*13.00-14.00*
Mixed borings, turnings	*13.00-14.00*
Cast iron borings	*13.00-14.00*
Cut foundry steel	37.00-38.00
Cut structurals, plates 2 ft and under	39.00-40.00
Low phos, punchings & plate	*34.00-35.00*
Alloy free, short shovel turnings	16.00-17.00
Electric furnace bundles	35.50-36.50

Cast Iron Grades

No. 1 cupola	42.00-43.00
Charging box cast	33.00-34.00
Heavy breakable cast	33.00-34.00
Stove plate	43.00-44.00
Unstripped motor blocks	25.00-26.00
Brake shoes	33.00-34.00
Clean auto cast	42.00-43.00
Burnt cast	30.00-31.00
Drop broken machinery	47.00-48.00

Railroad Scrap

R.R. malleable	60.00-61.00
Rails, 2 ft and under	56.00-57.00
Rails, 18 in. and under	57.00-58.00
Rails, random lengths	49.00-50.00
Cast steel	44.00-45.00
Railroad specialties	47.00-48.00
Uncut tires	40.00-41.00
Angles, splice bars	46.00-47.00
Rails, rerolling	51.00-52.00

Stainless Steel

(Brokers' buying prices; f.o.b. shipping point)

18-8 bundles, solids	*170.00-175.00*
18-8 turnings	*95.00-100.00*
430 clips, bundles, solids	*80.00-90.00*
430 turnings	40.00-50.00

ST. LOUIS

(Brokers' buying prices)

No. 1 heavy melting	33.00
No. 2 heavy melting	30.00
No. 1 bundles	34.00
No. 2 bundles	23.00
No. 1 busheling	33.00
Machine shop turnings	16.00†
Short shovel turnings	18.00†

Cast Iron Grades

No. 1 cupola	*43.00*
Charging box cast	35.00
Heavy breakable cast	33.00
Unstripped motor blocks	35.00
Clean auto cast	44.00
Stove plate	*42.00*

Railroad Scrap

No. 1 R.R. heavy melt.	36.50
Rails, 18 in. and under	50.00
Rails, random lengths	45.50
Rails, rerolling	56.00
Angles, splice bars	*47.00*

BIRMINGHAM

No. 1 heavy melting	30.00-31.00
No. 2 heavy melting	25.00-26.00
No. 1 bundles	30.00-31.00
No. 2 bundles	19.00-20.00
No. 1 busheling	30.00-31.00
Cast iron borings	12.00-13.00
Machine shop turnings	20.00-21.00
Short shovel turnings	21.00-22.00
Bars, crops and plates	40.00-41.00
Structurals & plates	39.00-40.00
Electric furnace bundles	34.00-35.00
Electric furnace: 2 ft and under	35.00-36.00
3 ft and under	34.00-35.00

Cast Iron Grades

No. 1 cupola	51.00-52.00
Stove plate	51.00-52.00
Unstripped motor blocks	*40.00-41.00*
Charging box cast	22.00-23.00
No. 1 wheels	*37.00-38.00*

Railroad Scrap

No. 1 R.R. heavy melt.	32.00-33.00
Rails, 18 in. and under	46.00-47.00
Rails, rerolling	*54.00-55.00*
Rails, random lengths	*44.00-45.00*
Angles, splice bars	40.00-41.00

PHILADELPHIA

No. 1 heavy melting	*35.00*
No. 2 heavy melting	*31.00*
No. 1 bundles	*35.00*
No. 2 bundles	24.00
No. 1 busheling	*35.00*
Electric furnace bundles	36.00
Mixed borings, turnings	*17.00†*
Short shovel turnings	*19.00*
Machine shop turnings	*17.00*
Heavy turnings	29.00
Structural & plate	39.00-40.00
Couplers, springs, wheels	43.50
Rail crops, 2 ft & under	55.00-56.00

Cast Iron Grades

No. 1 cupola	38.00
Heavy breakable cast	*41.00*
Malleable	58.00-59.00†
Drop broken machinery	47.00-48.00

NEW YORK

(Brokers' buying prices)

No. 1 heavy melting	*30.00-31.00*
No. 2 heavy melting	*27.00*
No. 1 bundles	*30.00-31.00*
No. 2 bundles	16.00-17.00
Machine shop turnings	8.00-9.00†
Mixed borings, turnings	9.00-10.00†
Short shovel turnings	11.00-12.00†
Low phos (structurals & plates)	33.00

Cast Iron Grades

No. 1 cupola	35.00-36.00
Unstripped motor blocks	24.00-25.00
Heavy breakable	33.00-34.00

Stainless Steel

18-8 sheets, clips, solids	155.00-160.00
18-8 borings, turnings	50.00-55.00
410 sheets, clips, solids	50.00-55.00
430 sheets, clips, solids	60.00-65.00

BUFFALO

No. 1 heavy melting	27.00-28.00
No. 2 heavy melting	23.00-24.00
No. 1 bundles	27.00-28.00
No. 2 bundles	21.00-22.00
No. 1 busheling	27.00-28.00
Mixed borings, turnings	13.00-14.00
Machine shop turnings	10.00-11.00
Short shovel turnings	14.00-15.00
Cast iron borings	13.00-14.00
Low phos. structurals and plate, 5 ft and under	32.00-33.00
2 ft and under	36.00-37.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	*38.00-39.00*
No. 1 machinery	*42.00-43.00*

Railroad Scrap

Rails, random lengths	46.00-47.00
Rails, 3 ft and under	52.00-53.00
Railroad specialties	36.00-37.00

CINCINNATI

(Buyers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	*34.00-35.00*
No. 2 heavy melting	28.00-29.00
No. 1 bundles	*34.00-35.00*
No. 2 bundles	22.00-23.00
No. 1 busheling	*34.00-35.00*
Machine shop turnings	11.50-12.50
Mixed borings, turnings	*12.50-13.50*
Short shovel turnings	13.50-14.50
Cast iron borings	11.50-12.50
Low phos. 18 in.	39.00-40.00

Cast Iron Grades

No. 1 cupola	40.00-41.00
Heavy breakable cast	32.00-33.00
Charging box cast	32.00-33.00
Drop broken machinery	*44.00-45.00*

Railroad Scrap

No. 1 R.R. heavy melt.	39.00-40.00
Rails, 18 in. and under	*52.00-53.00*
Rails, random lengths	*42.00-43.00*

HOUSTON

(Brokers' buying prices; f.o.b. cars)

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	32.00
No. 2 bundles	21.00†
Machine shop turnings	14.00
Short shovel turnings	17.00
Low phos. plates structurals	*37.00*

Cast Iron Grades

No. 1 cupola	*41.00*
Heavy breakable	30.00†
Unstripped motor blocks	*36.00*

Railroad Scrap

No. 1 R.R. heavy melt.	34.00

BOSTON

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	22.00-23.00
No. 2 heavy melting	18.00-19.00
No. 1 bundles	22.00-23.00
No. 2 bundles	14.00-15.00
No. 1 busheling	22.00-23.00
Machine shop turnings	*6.00-7.00*
Mixed borings, turnings	*6.00-7.00*
Short shovel turnings	7.00-8.00
No. 1 cast	28.00-29.00
Mixed cupola cast	27.00-28.00
No. 1 machinery cast	36.00-38.00

DETROIT

(Brokers' buying prices; f.o.b. shipping point)

No. 1 heavy melting	28.00-29.00
No. 2 heavy melting	21.00-22.00
No. 1 bundles	*31.00-32.00*
No. 2 bundles	18.00-19.00
No. 1 busheling	*29.00-30.00*
Machine shop turnings	8.00-9.00
Mixed borings, turnings	9.00-10.00
Short shovel turnings	9.00-10.00
Punchings & plate	31.00-32.00

Cast Iron Grades

No. 1 cupola	*37.00-38.00*
Stove plate	*29.00-30.00*
Charging box cast	*29.00-30.00*
Heavy breakable	*28.00-29.00*
Unstripped motor blocks	16.00-17.00
Clean auto cast	37.00-38.00

SEATTLE

No. 1 heavy melting	30.00†
No. 2 heavy melting	28.00†
No. 1 bundles	22.00†
No. 2 bundles	20.00†
Machine shop turnings	9.00-10.00†
Mixed borings, turnings	9.00-10.00†
Electric furnace No. 1	38.00

Cast Iron Grades

No. 1 cupola	31.00
Heavy breakable cast	28.00
Unstripped motor blocks	23.00
Stove plate (f.o.b. plant)	21.00

LOS ANGELES

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	28.00
No. 2 bundles	20.00
Machine shop turnings	11.00
Shoveling turnings	11.00
Cast iron borings	11.00
Cut structurals and plate 1 ft and under	45.00

Cast Iron Grades

(F.o.b. shipping point)

No. 1 cupola	41.00

Railroad Scrap

No. 1 R.R. heavy melt.	32.00

SAN FRANCISCO

No. 1 heavy melting	32.00
No. 2 heavy melting	30.00
No. 1 bundles	30.00
No. 2 bundles	22.00
Machine shop turnings	15.00
Mixed borings, turnings	15.00
Cast iron borings	15.00
Heavy turnings	15.00
Short shovel turnings	15.00
Cut structurals, 3 ft	40.00

Cast Iron Grades

No. 1 cupola	42.00
Charging box cast	34.00
Stove plate	34.00
Heavy breakable cast	28.00
Unstripped motor blocks	31.00
Clean auto cast	40.00
Drop broken machinery	40.00
No. 1 wheels	34.00

HAMILTON, ONT.

No. 1 heavy melting	30.00
No. 2 heavy melting	26.00
No. 1 bundles	30.00
No. 2 bundles	23.00
Mixed steel scrap	25.00
Mixed borings, turnings	15.00
Busheling, new factory: Prepared	30.00
Unprepared	24.00
Short steel turnings	19.00

Cast Iron Grades‡

No. 1 machinery cast	45.00-50.00

†Nominal.
‡F.o.b. Hamilton, Ont.

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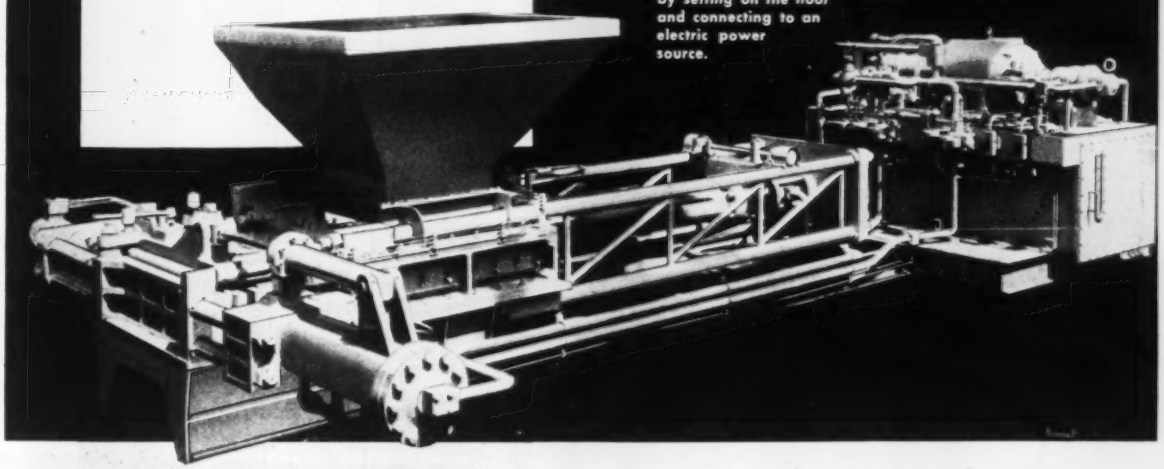
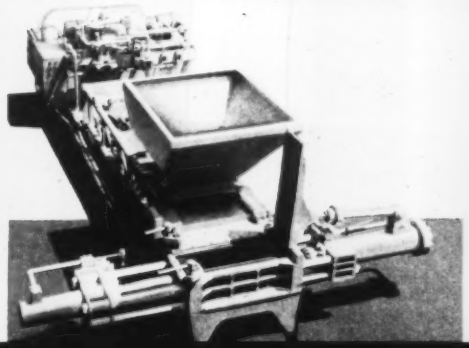


BALE SIZE	6" x 12" x 8" (VARIABLE)
BALE WEIGHT	40 LBS. AVERAGE
PRODUCTION	UP TO 240 BALES PER HOUR



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Will Aluminum Price Rise?

Producers would like to increase quotations, but they won't consider a move unless steel goes up. Copper and zinc statistics show June improvement

Nonferrous Metal Prices, Pages 172 & 173

ALUMINUM PRODUCERS would like nothing better than to jack up prices around 8 per cent when they get hit with higher labor costs on Aug. 1. But they candidly admit market conditions may not permit such a move.

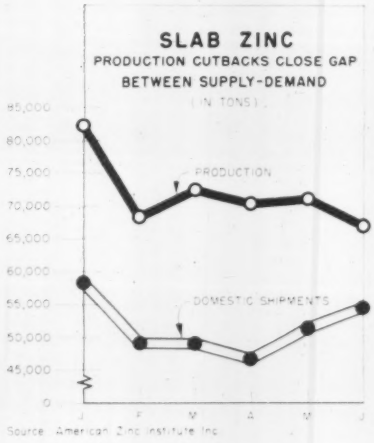
More Expenses—Here's how the industry would justify an increase: The upcoming labor package calls for an 8 cent an hour wage hike, a 4 cent cost of living adjustment, and 4 cents in fringe benefits. Counting the 3 cents the higher hourly rate will add to social security and welfare costs and the 5 cents per hour cost of living adjustment granted Feb. 1, you have a total 1958 wage increase of 24 cents an hour.

Another factor: The industry's reduced output has hiked the per pound cost. Capacity now stands at 2,062,500 tons, but the current operating rate is around 1,459,000 tons per year. Much of the idle capacity was built with borrowed money, which means the industry has to make payments on unproductive facilities.

Aluminum products cost around 8 per cent less than they did last fall as a result of the price drop on Apr. 1. It means profits in the second and third quarters will be well below those of the first quarter, which, in turn, were under those for the same period of 1957. Examples: Aluminum Co. of America had first quarter profits of $11,459,000, compared with $18,594,000 in 1957; Kaiser Aluminum & Chemical Corp., earned $6,419,000, compared with $8,267,000. Reynolds Metals Co. was the only producer to improve ($9,910,345, compared with $9,880,571), but the gain was mainly because it had a contract calling for large puts to the government during the period.

Price Guides—Watch what steel prices do as indication of what could happen in aluminum. Producers admit they stand little chance of putting through an increase unless steel leads the way.

Even if steel goes up, aluminum faces another possible price deterrent: The big Canadian competitor, Aluminium Ltd., might not follow. Aluminium Ltd. triggered the spring price drop with the announcement that it was lowering quotations on a world-wide basis to stimulate demand. There's no indication the firm has changed its stand, although domestic companies say they can't see that the adjustment improved business. One thing's certain: If Aluminium won't go along with a hike (and the company hasn't stated its position yet), domestic producers won't be able to go higher.



Source: American Zinc Institute Inc.

Metal Statistics Better

Copper and zinc improved in June as shipments rose and production fell.

U. S. refined copper deliveries to fabricators hit 100,296 tons for the best month since January and a marked improvement over the 78,631 tons shipped in May, reports the Copper Institute. At the same time, refined production dropped to 107,474 tons, the lowest output any month this year. Result: Refined stocks decreased by about 9000 tons to 244,421 tons.

July sales aren't holding up to June levels, mainly because of traditional vacation shutdowns in the brass mill industry. Custom smelters aren't booking much business at the 26 cent a pound figure, but it's likely the price will hold for the present. The price split ended in primary copper—Phelps Dodge, Anaconda, and Kennecott are now all quoting 26.5 cents a pound.

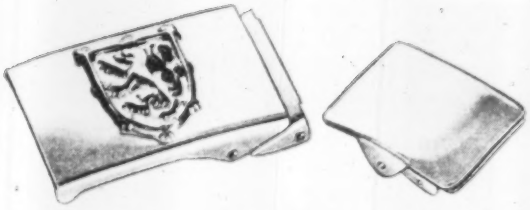
The June zinc report parallels that of copper: Domestic shipments climbed while production dropped (see chart). The main difference is that zinc showed a 12,000-ton gain and stands at 252,979 tons.

Demand is still at mediocre levels. The London Metal Exchange was down to where European metal could be brought in at under the domestic price, but it rebounded on the news of U. S. troops being sent to Lebanon. This speculative strength in the market should add some muscle to the present price.

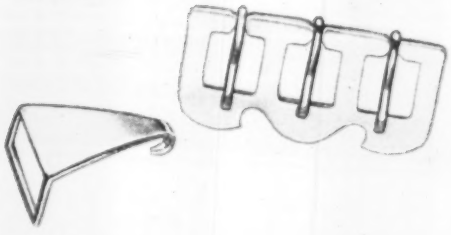
NONFERROUS PRICE RECORD

	Price July 16	Last Change	Previous Price	June Avg	May Avg	July, 1957 Avg
Aluminum	24.00	Apr. 1, 1958	26.00	24.000	24.000	25.000
Copper	26.00-26.50	July 16, 1958	25.00-26.50	25.400	24.433	28.822
Lead	10.80	July 1, 1958	11.30	11.040	11.512	13.800
Magnesium	35.25	Aug. 13, 1956	33.75	35.250	35.250	35.250
Nickel	74.00	Dec. 6, 1956	64.50	74.000	74.000	74.000
Tin	94.75	July 16, 1958	94.25	94.701	94.510	96.576
Zinc	10.00	July 1, 1957	10.50	10.000	10.000	10.000

Quotations in cents per pound based on: COPPER, mean of primary and secondary, deld. Conn. Valley; LEAD, common grade, deld. St. Louis; ZINC, prime western, E. St. Louis; TIN, Straits, deld. New York; NICKEL, electrolytic cathodes, 99.9%, base size at refinery, unpacked; ALUMINUM, primary pig, 99.5+%, f.o.b. shipping point; MAGNESIUM, pig, 99.8%, Velasco, Tex.



Polishing rejects down from 8% to 1%



Metal Buckles by Domar Buckle Mfg. Co.

Withstands 3-4 time reduction in difficult deep draw

Flower Pot is 4½" high x 5" diameter

CHASE® S-19 PROCESS BRASS STRIP GIVES YOU EXACT "JOB-TAILORED" SPECIFICATIONS PLUS SAVINGS

L&R Metal Products Division of Domar Buckle Mfg. Co. reports reduction in polishing rejects from 8% to 1%, plus additional 5% saving traceable to careful gauge control used in making Chase S-19 Process Brass Strip and Sheet.

Artistic Manufacturing Company says: "Our flowerpot is a tough draw. We draw, reduce 3-4 times, anneal, hammer, polish, then lacquer. Chase S-19 Brass has consistent quality, and never orange peels in spite of the tough handling."

These are two of hundreds of cases where users have made production savings with Chase S-19 Process Brass Strip and Sheet. This Chase exclusive process can provide metal of 40-62 Rockwell B with a "job-tailored" list of properties to meet exact and specific needs. With S-19, you can order *and get* the right combination of elongation, tensile, yield and grain size. And you get still more—unrivalled surface that takes a final finish with minimum buffing, combined with fatigue resistance no other strip or sheet can match. Be sure to ask your Chase Representative how S-19 Process Brass can help you to a better product at lower cost. You can reach him locally, or by writing Waterbury 20, Connecticut.

Chase®

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WATERBURY 20, CONN.
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The Nation's Headquarters for Brass, Copper and Stainless Steel

Atlanta Baltimore Boston Charlotte Chicago Cincinnati Cleveland Dallas Denver Detroit Grand Rapids Houston Indianapolis Kansas City, Mo. Los Angeles Milwaukee Minneapolis Newark New Orleans New York (Maspeth, L.I.) Philadelphia Pittsburgh Providence Rochester St. Louis San Francisco Seattle Waterbury

Nonferrous Metals

Cents per pound, carlots except as otherwise noted.

PRIMARY METALS AND ALLOYS

Aluminum: 99.5%, pigs, 24.00; ingots, 26.10, 30,000 lb or more, f.o.b. shipping point. Freight allowed on 500 lb or more.

Aluminum Alloy: No. 13, 27.90; No. 43, 27.70; No. 195, 28.70; No. 214, 29.50; No. 356, 27.90, 30-lb ingots.

Antimony: R.M.M. brand, 99.5%, 29.00; Lone Star brand, 29.50; f.o.b. Laredo, Tex., in bulk. Foreign brands, 99.5%, 23.50-24.50, New York, duty paid, 10,000 lb or more.

Beryllium: 97% lump or beads, $71.50 per lb, f.o.b. Cleveland or Reading, Pa.

Beryllium Aluminum: 5% Be, $74.75 per lb of contained Be, with balance as Al at market price, f.o.b. shipping point.

Beryllium Copper: 3.75-4.25% Be, $43 per lb of contained Be, with balance as Cu at market price on shipment date, f.o.b. shipping point.

Bismuth: $2.25 per ton, ton lots.

Cadmium: Sticks and bars, $1.55 per lb deld.

Cobalt: 97.99%, $2.00 per lb for 550-lb keg; $2.02 per lb for 100 lb case; $2.07 per lb under 100 lb.

Columbium: Powder, $55-85 per lb, nom.

Copper: Electrolytic, 25.00-26.50 deld.; custom smelters, 26.00; lake, 25.00-26.50 deld.; fire refined, 24.75-26.25 deld.

Germanium: First reduction, $179.17-197.31 per lb; intrinsic grade, $197.31-220 per lb, depending on quantity.

Gold: U. S. Treasury, $35 per oz.

Indium: 99.9%, $2.25 per troy oz.

Iridium: $70-80 nom. per troy oz.

Lead: Common, 10.80; chemical, 10.90; corroding, 10.90, St. Louis. New York basis, add 0.20.

Lithium: 98 + %, 50-100 lb, cups or ingots, $12; rod, $15; shot or wire, $16. 100-500 lb, cups or ingots, $10.50; rod, $14; shot or wire, $15, f.o.b. Minneapolis.

Magnesium: Pig, 35.25; ingot, 36.00 f.o.b. Velasco, Tex.; 12 in. thick, 59.00 f.o.b. Madison, Ill.

Magnesium Alloys: AZ91A (diecasting), 40.75 deld.; AZ63A, AZ92A, AZ91C (sand casting), 40.75, f.o.b. Velasco, Tex.

Mercury: Open market, spot, New York, $228-230 per 76-lb flask.

Molybdenum: Unalloyed, turned extrusions, 3.75-5.75 in. round, $9.60 per lb in lots of 2500 lb of more, f.o.b. Detroit.

Nickel: Electrolytic cathodes, sheets (4 x 4 in. and larger), unpacked, 74.00; 10-lb pigs, unpacked, 78.25; "XX" nickel shot, 79.50; "F" nickel shot for addition to cast iron, 74.50; "F" nickel, 5 lb ingots in kegs for addition to cast iron, 75.50. Prices f.o.b. Port Colborne, Ont., including import duty, New York basis, add 1.01. Nickel oxide sinter, 71.25 per lb of nickel content before 1 cent freight allowance, f.o.b. Copper Cliff, Ont.

Osmium: $70-100 per troy oz nom.

Palladium: $19-21 per troy oz.

Platinum: $62-70 per troy oz from refineries.

Radium: $16-21.50 per mg radium content, depending on quantity.

Rhodium: $118-125 per troy oz.

Ruthenium: $45-55 per troy oz.

Selenium: $7.00 per lb, commercial grade.

Silver: Open market 88.625 per troy oz.

Sodium: 17.00, c.l.; 19.00-19.50 l.c.l.

Tantalum: Rod, $60 per lb; sheet, $55 per lb.

Tellurium: $1.65-1.85 per lb.

Thallium: $7.50 per lb.

Tin: Straits, N. Y., spot and prompt, 94.75.

Titanium: Sponge, 99.3+ % grade A-1, ductile (0.3% Fe max.), 2.05; grade A-2 (0.5% Fe max.), $1.85 per lb.

Tungsten: Powder, 98.8%, carbon reduced, 1000-lb lots, $3.15 per lb nom., f.o.b. shipping point; less than 1000 lb, add 15.00; 99 + % hydrogen reduced, $3.85.

Zinc: Prime Western, 10.00; brass special, 10.25; intermediate, 10.50, East St. Louis, freight allowed over 0.50 per lb, New York basis, add 0.50. High grade, 11.00; special high grade, 11.25 deld. Diecasting alloy ingot No. 3, 12.75; No. 2, 13.25; No. 5, 13.00 deld.

Zirconium: Sponge, commercial grade, $5-10 per lb.

(Note: Chromium, manganese, and silicon metals are listed in ferroalloy section.)

SECONDARY METALS AND ALLOYS

Aluminum Ingot: Piston alloys, 22.50-24.00; No. 12 foundry alloy (No. 2 grade), 21.25-21.50; 5% silicon alloy, 0.60 Cu max., 24.00-24.25; 13 alloy 0.60 Cu max., 24.00-24.25; 195 alloy, 24.25-25.50; 108 alloy, 21.75. Steel deoxidizing grades, notch bars, granulated or shot: Grade 1, 22.25; grade 2, 21.25; grade 3, 20.00; grade 4, 17.25.

Brass Ingot: Red brass, No. 115, 27.00; tin bronze, No. 225, 36.00; No. 245, 30.75; high-leaded tin bronze, No. 305, 31.25; No. 1 yellow, No. 405, 22.75; manganese bronze, No. 421, 24.50.

Magnesium Alloy Ingot: AZ63A, 37.50; AZ91B, 37.50; AZ91C, 41.25; AZ92A, 37.50.

NONFERROUS PRODUCTS

BERYLLIUM COPPER

(Base prices per lb, plus mill extras, 2000 to 5000 lb; nom. 1.9% Be alloy.) Strip, $1.80, f.o.b. Template, Pa., or Reading, Pa.; rod, bar, wire, $1.78, f.o.b. Temple, Pa.

COPPER WIRE

Bare, soft, f.o.b. eastern mills, 30,000-lb lots, 30.35; l.c.l., 30.98. Weatherproof, 30,000-lb lots, 32.53. Magnet wire deld., 38.43, before quantity discounts.

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh.) Sheets, full rolls, 140 sq ft or more, $15.50 per cwt; pipe, full coils, $15.50 per cwt; traps and bends, list prices plus 30%.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill.) Sheets and strip, $8.50-15.95; sheared mill plate, $6.00-9.50; wire, $6.50-11.00; forging billets, $4.10-4.35; hot-rolled and forged bars, $5.25-6.35.

ZINC

(Prices per lb, c.l., f.o.b. mill.) Sheets, 24.00; ribbon zinc in coils, 20.50; plates, 19.00.

ZIRCONIUM

Plate, $12.50-19.20; H.R. strip, $12.50-22.90; C.R. strip, $15.90-31.25; forged or H.R. bars, $11.00-17.40.

NICKEL, MONEL, INCONEL

	"A" Nickel	Monel	Inconel
Sheets, C.R.	126	106	128
Strips, C.R.	124	108	138
Plate, H.R.	120	105	121
Rod, Shapes, H.R.	107	89	109
Seamless Tubes	157	129	200

ALUMINUM

Sheets: 1100, 3003, and 5005 mill finish (30,000 lb base; freight allowed).

Thickness Range, Inches	Flat Sheet	Coiled Sheet
0.249-0.136	41.10-45.60	.....
0.135-0.096	41.60-46.70	.....
0.125-0.096	.....	38.50-39.10
0.096-0.077	42.30-48.50	38.60-39.30
0.076-0.061	42.90-50.80	38.80-40.00
0.060-0.048	43.60-53.10	39.40-41.10
0.047-0.038	44.20-55.90	39.90-32.50
0.037-0.030	44.60-60.90	40.30-44.30
0.029-0.024	45.20-52.70	40.60-45.00
0.023-0.019	46.20-56.10	41.70-43.40
0.018-0.017	47.00-53.40	42.30-44.00
0.016-0.015	47.90-54.30	43.10-44.80
0.014	48.90	44.10-45.80
0.013-0.012	50.10	44.80
0.011	51.10	46.00
0.010-0.0095	52.60	47.40
0.009-0.0085	53.90	48.90
0.008-0.0075	55.50	50.10
0.007	57.00	51.60
0.006	58.60	53.00

ALUMINUM (continued)

Plates and Circles: Thickness 0.250-3 in., 24-60 in. width or diam., 72-240 in. lengths.

Alloy	Plate Base	Circle Base
1100-F, 3003-F	41.70	46.50
5050-F	42.80	47.60
3004-F	43.80	49.50
5052-F	44.40	50.20
6061-T6	44.90	51.00
2024-T4	48.60	55.40
7075-T6*	56.40	64.00

*24-48 in. width or diam., 72-180 in. lengths.

Screw Machine Stock: 30,000 lb base.

Diam. (in.) or across flats	Round 2011-T3	Round 2017-T4	Hexagonal 2011-T3	Hexagonal 2017-T4
Drawn				
0.125	76.20	73.20	....	....
0.156	64.20	61.40	....	....
0.172	....	61.40	....	....
0.188	64.20	61.40	....	79.60
0.203	64.20	61.40	....	....
0.219-0.234	61.00	59.50	....	....
0.250	61.00	59.50	88.40	75.90
0.266-0.281	61.00	59.50	....	....
0.313	61.00	59.50	81.40	72.20
0.344	60.50	....	81.40	....
Cold-Finished				
0.375-0.547	60.50	59.30	72.80	67.80
0.563-0.688	60.50	59.30	69.10	63.50
0.719	....	57.70	....	....
0.750-1.000	59.00	57.70	62.90	59.70
1.063	59.00	57.70	....	57.60
1.250-1.500	56.60	55.40	60.80	57.60
Rolled				
1.563	55.00	53.70	....	....
1.625-2.000	54.30	52.90	59.60	55.50
2.063	....	51.40	....	....
2.125-2.500	52.80	51.40	....	55.50
2.500-3.000	51.20	49.70	....	55.50
3.250-3.375	....	49.70	....	....

Forging Stock: Round, Class 1, random lengths, diam. 0.688-8 in., "F" temper; 2014, 41.50-54.30; 6061, 40.90-54.30; 7075, 42.90-56.30; 7079, 43.40-56.80.

Pipe: ASA schedule 40, alloy 6063-T6, standard lengths, plain ends, 90,000 lb base, dollars per 100 ft. Nominal pipe sizes: ¾ in., 18.60; 1 in., 29.35; 1¼ in., 39.75; 1½ in., 47.50; 2 in., 57.40; 4 in., 157.60; 6 in., 282.95; 8 in., 425.80.

Extruded Solid Shapes:

Factor	Alloy 6063-T5	Alloy 6062-T6
9-11	42.00-43.50	58.60-62.80
12-14	42.00-43.50	59.30-63.80
15-17	42.00-43.50	60.50-65.50
18-20	42.50-44.00	62.50-68.10

MAGNESIUM

Sheet and Plate: AZ31B standard grade, 0.32 in., 103.10; .081 in., 77.90; .125 in., 70.40; .188 in., 69.00; .250-2.0 in., 67.90. AZ31B spec. grade, .032 in., 171.30; .081 in., 108.70; .125 in., 98.10; .188 in., 95.70; .250-2.00 in., 93.30. Tread plate, 60-192 in. lengths, 24-72 in. widths: .125 in., 74.90; .188 in., 71.70-72.70; .25-.75 in., 70.60-71.60. Tooling plate, .25-3.0 in., 73.00.

Extruded Solid Shapes:

Factor	Com. Grade (AZ31C)	Spec. Grade (AZ31B)
6-8	69.60-72.40	84.60-87.40
12-14	70.70-73.00	85.70-88.00
24-26	75.60-76.30	90.60-91.30
36-38	89.20-90.30	104.20-105.30

NONFERROUS SCRAP

DEALER'S BUYING PRICES

(Cents per pound, New York, in ton lots.)

Copper and Brass: No. 1 heavy copper and wire, 19.75-20.25; No. 2 heavy copper and wire, 18.00-18.50; light copper, 16.00-16.50; No. 1 composition red brass, 16.00-16.50; No. 1 com-

BRASS MILL PRICES

	MILL PRODUCTS a				SCRAP ALLOWANCES e (Based on copper at 26.50c)		
	Sheet, Strip, Plate	Rod	Wire	Seamless Tubes	Clean Heavy	Rod Ends	Clean Turnings
Copper	48.13-49.63b	45.36-46.86c	....	48.32-49.82	22.500	22.500	21.750
Yellow Brass	42.69-43.57	29.53-30.28d	43.23-44.11	45.60-46.48	17.000	16.750	15.250
Low Brass, 80%	44.90-46.03	44.84-45.97	45.44-46.57	47.71-48.84	19.000	18.750	18.250
Red Brass, 85%	45.67-46.89	45.61-46.83	46.21-47.43	48.48-49.70	19.750	19.500	19.000
Com. Bronze, 90%	46.98-48.30	46.92-48.24	47.52-48.84	49.54-50.86	20.625	20.375	19.875
Manganese Bronze	50.81-51.52	44.91-45.74	55.44-56.18	....	15.875	15.625	14.875
Muntz Metal	45.19-45.95	41.00-41.76	....	....	15.875	15.625	15.125
Naval Brass	47.07-47.83	41.38-42.14	54.13-54.89	50.48-50.99	15.625	15.375	14.875
Silicon Bronze	52.84-54.37	52.03-53.56	52.88-54.41	54.77-56.29	22.125	21.875	21.125
Nickel Silver, 10%	57.93-58.82	60.26-61.15	60.26-61.15	....	22.000	21.750	....
Phos. Bronze, A-5%	67.17-68.59	67.67-69.09	67.67-69.09	68.85-70.72	23.375	23.125	22.125

a. Cents per lb, f.o.b. mill; freight allowed on 500 lb or more. b. Hot-rolled. c. Cold-drawn. d. Free cutting. e. Prices in cents per lb for less than 20,000 lb, f.o.b. shipping point. On lots over 20,000 lb at one time, or any or all kinds of scrap, add 1 cent per lb.

positions turnings, 15.00-15.50; new brass clippings, 13.50-14.00; light brass, 9.50-10.00; heavy yellow brass, 11.00-11.50; new brass rod ends, 11.50-12.00; auto radiators, unsweated, 12.00-12.50; cocks and faucets, 13.00-13.50; brass pipe, 13.00-13.50.

Lead: Heavy, 6.75-7.25; battery plates, 3.00-3.25; linotype and stereotype, 9.25-9.75; electrotype, 7.50 8.00; mixed babbitt, 9.00-9.50.

Monel: Clippings, 28.00-29.00; old sheets, 25.00-26.00; turnings, 20.00-23.00; rods, 28.00-29.00.

Nickel: Sheets and clips, 42.00-45.00; rolled anodes, 42.00-45.00; turnings, 37.00-40.00; rod ends, 42.00-45.00.

Zinc: Old zinc, 3.00-3.25; new diecast scrap, 2.75-3.00; old diecast scrap, 1.50-1.75.

Aluminum: Old castings and sheets, 9.50-10.00; clean borings and turnings, 6.00-6.50; segregated low copper clips, 13.00-13.50; segregated high copper clips, 12.00-12.50; mixed low copper clips, 13.00-14.00; mixed high copper clips, 11.00-11.50.

(Cents per pound, Chicago)

Aluminum: Old castings and sheets, 10.00-10.50; clean borings and turnings, 9.00-9.50; segregated low copper clips, 15.50-16.00; segregated high copper clips, 14.00-14.50; mixed low copper clips, 15.00-15.50; mixed high copper clips, 13.50-14.00.

(Cents per pound, Cleveland)

Aluminum: Old castings and sheets, 9.00-9.50; clean borings and turnings, 8.00-8.50; segregated low copper clips, 12.50-13.00; segregated high copper clips, 11.00-11.50; mixed low copper clips, 11.50-12.00; mixed high copper clips, 10.50-11.00.

REFINERS' BUYING PRICES

(Cents per pound, carlots, delivered refinery)

Beryllium Copper: Heavy scrap, 0.020-in. and heavier, not less than 1.5% Be, 51.00; light scrap, 46.00; turnings and borings, 31.00.

Copper and Brass: No. 1 heavy copper and wire, 21.50; No. 2 heavy copper and wire, 20.75; light copper, 18.50; refinery brass (60% copper) per dry copper content, 19.75.

INGOTMAKERS' BUYING PRICES

Copper and Brass: No. 1 heavy copper and wire, 21.50; No. 2 heavy copper and wire, 20.75; light copper, 18.50; No. 1 composition borings, 18.50; No. 1 composition solids, 19.00; heavy yellow brass solids, 13.25; yellow brass turnings, 12.25; radiators, 15.00.

PLATING MATERIALS

(F.o.b. shipping point, freight allowed on quantities)

ANODES

Cadmium: Special or patented shapes, $1.55.

Copper: Flat-rolled, 41.79; oval, 40.00. 5000-10,000 lb; electrodeposited, 35.25, 2000-5000 lb lots; cast, 37.75, 5000-10,000 lb quantities.

Nickel: Depolarized, less than 100 lb, 114.25; 100-499 lb, 112.00; 500-4999 lb, 107.50; 5000-29,999 lb, 105.25; 30,000 lb, 103.00. Carbonized, deduct 3 cents a lb.

Tin: Bar or slab, less than 200 lb, 112.50; 200-499 lb, 111.00; 500-999 lb, 110.50; 1000 lb or more, 110.00.

Zinc: Balls, 16.00; flat tops, 16.00; flats, 19.25; ovals, 18.50, ton lots.

CHEMICALS

Cadmium Oxide: $1.70 per lb in 100-lb drums.

Chromic Acid (flake): 100-2000 lb, 31.00; 2000-10,000 lb, 30.50; 10,000-20,000 lb, 30.00; 20,000 lb or more, 29.50.

Copper Cyanide: 100-200 lb, 65.90; 300-900 lb, 63.90; 1000-19,900 lb, 61.90.

Copper Sulphate: 100-1900 lb, 13.70; 2000-5900 lb, 11.70; 6000-11,900 lb, 11.45; 12,000-22,900 lb, 11.20; 23,000 lb or more, 10.70.

Nickel Chloride: 100 lb, 48.50; 200 lb, 46.50; 300 lb, 45.50; 400-999 lb, 43.50; 10,000 lb or more, 40.50.

Nickel Sulphate: 5000-22,000 lb, 29.00; 23,000-35,900 lb, 28.50; 36,000 lb or more, 28.00.

Sodium Cyanide (Cyanobrik): 200 lb, 20.80; 400-800 lb, 19.80; 1000-19,800 lb, 18.80; 20,000 lb or more, 17.80.

Sodium Stannate: Less than 100 lb, 75.80; 100-600 lb, 66.80; 700-1900 lb, 64.00; 2000-9900 lb, 62.20; 10,000 lb or more, 60.80.

Stannous Chloride (anhydrous): 10 lb, 100.757; 25 lb, 100.507; 100 lb, 100.459; 400 lb, 100.434; 800-19,900 lb, 100,026; 20,000 lb or more, 96.50.

Stannous Sulphate: Less than 50 lb, 100.361; 50 lb, 100.061; 100-1900 lb, 100.041; 2000 lb or more, 100.021.

Zinc Cyanide: 100-200 lb, 59.00; 300-900 lb, 57.00.

(Concluded from Page 167)

largely because of shrinking tonnage.

Cincinnati—Prices on the No. 1 grades have regained ground lost earlier this month, and mixed borings and turnings have moved higher.

Buffalo—Cast scrap prices eased $1 a ton in this market last week. With most foundries closed for vacations, and demand for scrap light, a small sale of cupola grade went at $38-$39, off $1 a ton from the last sale. No. 1 machinery cast also dropped $1.

Detroit—Area dealers and brokers think the local market is due for an upsurge by the end of August, or in early September, as new model automobiles start rolling from assembly lines and the demand for steel improves. As a result, the market is

"FASTER FROM FOSTER"
RAIL
& ALL TRACK EQUIPMENT
Nation's Largest Warehouse Stocks
L. B. FOSTER CO.
PITTSBURGH 30 • ATLANTA 8 • NEW YORK 7
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FOR SALE

2—G. E. Furnaces for Brazing, Heat Treating or Sintering Hand Pusher Type, complete with cooling chamber, atmosphere generator, controls and transformers. 2100°F, 50 KW, 440 Volt. Good condition. Very Reasonable price.

TRAYER PRODUCTS, INCORPORATED
Elmira, New York

MOTORS • GENERATORS
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NEW • REBUILT
World's Largest Inventory
ELECTRIC EQUIPMENT COMPANY
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TECHNICAL DIRECTOR

National Trade Association seeks competent man experienced in cast metals and general engineering for responsible position as Technical Director. Position requires some specific malleable foundry knowledge. Will handle development and research projects, coordination of broad technical program and relations with engineers and Technical Societies. Progressive organization, excellent future. Some travel. Write giving personal background and qualifications. Replies confidential.

MALLEABLE FOUNDERS' SOCIETY
1800 Union Commerce Building
Cleveland 14, Ohio

WANTED

Late model 10-ton capacity 220 volt A.C. 3 phase, 60 cycle crane, 60 foot centers in good condition. Your full description and price.

Box 677, STEEL
Penton Bldg. Cleveland 13, Ohio

CLASSIFIED

Help Wanted

GENERAL MANAGER
MATERIALS HANDLING INDUSTRY

This is a newly created top-level management position reporting directly to the Executive Vice President. The responsibilities include the direction of all manufacturing and sales activities for our process and materials handling division.

We are seeking an executive who has general management experience, specifically in the materials processing industry.

We are a multi-division company who, on the basis of our long-range planning program, will continue to grow and expand.

The base salary is open and our compensation program includes bonus based on performance. In addition, we have the normal employee benefits.

In first reply, please include information regarding age, experience, compensation and education. All replies confidential. Write Box 676, STEEL, Penton Bldg., Cleveland 13, Ohio.

ROLL DESIGNER

For steel rolling mill in Eastern United States. Experience in small shapes required. State age, experience and salary expected to Box 673, STEEL, Penton Bldg., Cleveland 13, Ohio.

SUPERINTENDENT

For Large, Well Established, Structural Steel Fabricating Plant in Pittsburgh Area

- Excellent salary and fringe benefits.
- Must have successful background in running steel fabricating shop. Excellent opportunity for advancement for man with ability and ambition.
- Write fully, giving age, education and employment background.

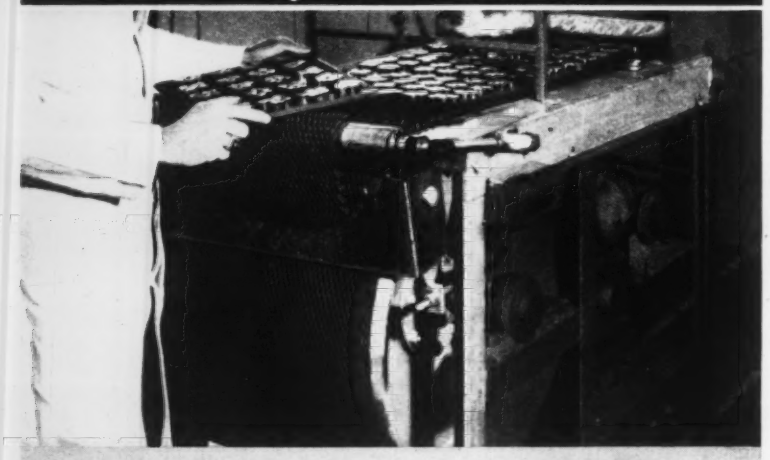
All replies confidential.

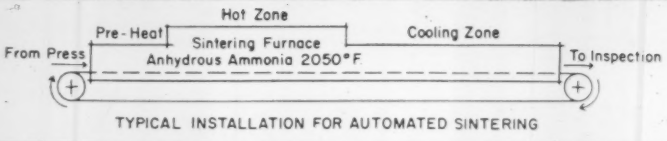
Reply Box 675, STEEL
Penton Building Cleveland 13, Ohio

LOOKING FOR SURPLUS MACHINERY?

By checking the classified pages of STEEL each week you'll be able to find many different types of equipment which will fit your requirements. Used or surplus equipment—you can best find it in STEEL's classified columns.

Cambridge WOVEN WIRE BELTS





TYPICAL INSTALLATION FOR AUTOMATED SINTERING

METAL-MESH BELTS CUT OPERATING COSTS IN CONTINUOUS HEAT TREATING

Moving through a fiery 2050° F. temperature to fuse metal powders, Cambridge Woven Wire Belts easily resist heat and flame to give long service life, less maintenance, continuous, uniform production. Belt-to-belt flow of products through various heat treating operations eliminates costly manual handling, batch processing for faster, more economical production.

In annealing, quenching and washing operations, Cambridge belts help increase product uniformity and maintain capacity production. Here's why:

OPEN MESH ALLOWS FREE CIRCULATION OF HOT GASES, LIQUIDS through belt and around product for faster, more uniform processing; quench and wash solutions drain freely, thoroughly.

ALL-METAL CONSTRUCTION IS HEATPROOF, ACIDPROOF—takes up to 2100° F. temperatures; resists corrosive attack; has no seams, lacers or fasteners to break.

SPECIAL SURFACE ATTACHMENTS AVAILABLE—raised edges or cross flights to hold product on belt during movement.

Talk to your Cambridge FIELD ENGINEER soon—he'll explain the many advantages of continuous heat treating on Cambridge belts. And, he'll recommend the belt size, mesh or weave—in the metal or alloy—best suited to your operations. You'll find his name in the classified phone book under the heading "BELTING, MECHANICAL". Or, write for FREE 130-PAGE REFERENCE MANUAL giving mesh specifications, design information and metallurgical data.

The Cambridge Wire Cloth Co.

WIRE CLOTH | METAL CONVEYOR BELTS | SPECIAL METAL FABRICATIONS

Department J, Cambridge 7, Maryland

OFFICES IN PRINCIPAL INDUSTRIAL CITIES

slightly more active on the dealer level.

Boston—Borings and turnings are slightly firmer here. Brokers are paying $1 more for tonnage, offering $6-$7 for machine shop turnings and mixed borings and turnings.

St. Louis—Scrap prices are unchanged here save for the cast iron grades which are moving slightly upward on demand pressure from outside the district.

Birmingham — Principal activity in the local scrap market is in electric furnace grades.

Houston—The only Texas mill to purchase scrap this month has extended shipments on its outstanding July commitments through August. The move is believed to indicate that its buying will be limited next month.

San Francisco—Scrap dealers are marking time here. The mills are taking in a little material, but not enough to jog the district market.

Los Angeles—Dealers report the local market appears to be softening, but so far prices are unchanged.

Seattle—The scrap market is unchanged. Dealers anticipate slow demand over coming weeks. Yards are operating on reduced schedules.

Freight Compromise Wins

The Southern Freight Association has accepted a compromise freight rate proposal that raises scrap rates 3 per cent, maximum 40 cents per ton, in place of the flat 40 cents a ton approved earlier this year by the Interstate Commerce Commission.

Earlier, the Chicago & Northwestern acted independently of other Midwest roads to institute the 3 per cent, maximum 40 cents, rate.

Germany Needs Scrap

West Germany, which has relied heavily on American scrap since World War II, still needs tonnage from this country, though more domestic scrap is available in Germany and from other European Coal & Steel Community countries, reports Edwin C. Barringer, executive vice president, Institute of Scrap Iron & Steel Inc. German steel mill operations, have declined, but less than those in the U. S. In the opinion of leading German economists, the U. S. will start pulling out of its recession this fall, to avert a major depression in Europe.

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HOTEL CLEVELAND

Cleveland Room

Dine in the splendid old world setting of a grand dining room. The menu is varied, the service unexcelled.

Bronze Room

One of the brightest of the city's supper clubs. Dancing nightly from 9:00 p.m. Air conditioned, of course.

Rib Room

A true specialty restaurant For Fabulous Roast Beef, roasted, carved and served to your order.

MEN'S BAR

Strictly stag — is this all male haven for good drinks, good food and good talk. Plus sports events on TV.

TRANSIT BAR

For rapid service in the most unique bar in the country . . . decorated with an outstanding collection of miniature trains.

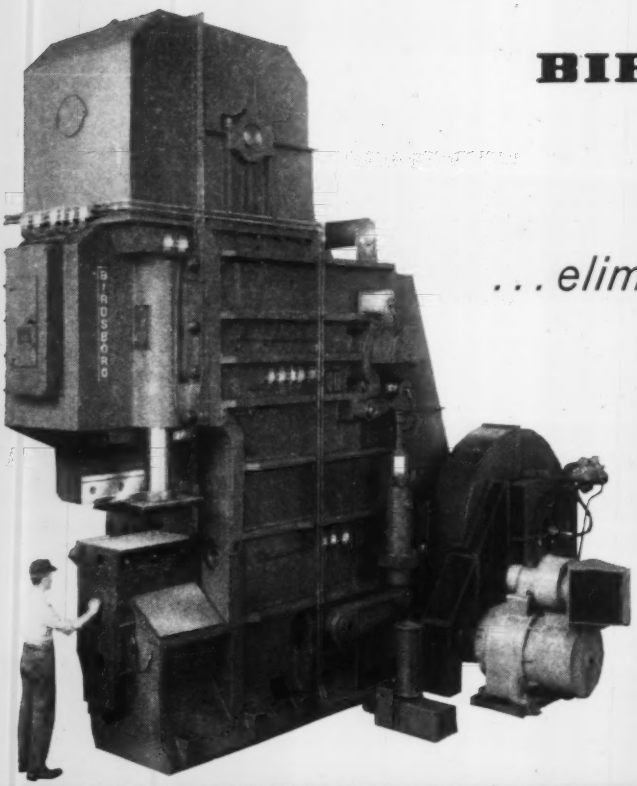
the PATIO

Pause — in the relaxing, informal atmosphere of the gayly decorated Patio. It's a Cleveland habit to say — "Meet me at the Patio."

Coffee Shop

Service is brisk and decor cheerful in the modern, air-conditioned coffee shop. Enjoy a tasty sandwich or a moderately priced meal.

HCA Hotel Cleveland
CLEVELAND, OHIO



BIRDSBORO *1000-ton bloom and slab shear assures hook-free ends ... eliminates depressing tables*

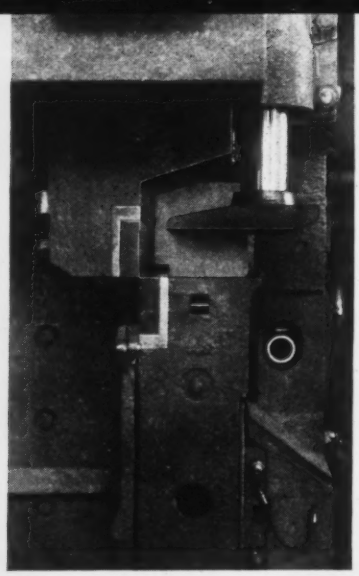
• This shear, largest of its type in the country, cuts hot steel blooms up to 16″ square, and slabs up to $6\frac{1}{2}$″ x 42″. The shear is a rapid cycle machine that completes one cut in $4\frac{1}{2}$ seconds.

Actual cutting is done by the RISING action of the *bottom* knife. This eliminates the need for depressing tables or related equipment. A special hold-down device is linked to the bottom knife during the cutting stroke. The resulting clamping action holds the work firmly and gives square-cut ends free from hook.

Schematic view of Birdsboro Bloom & Slab Shear in action

Hold-down gag clamps piece firmly against bottom knife

Shearing action is completed with rising stroke of bottom knife and gag



You can learn more about this job-proven shear and other recent Birdsboro developments from your nearest representative or: *Main Office, Engineering Department and Plant:* Birdsboro, Pa., *District Office:* Pittsburgh, Pa.

MM 69-58

BIRDSBORO

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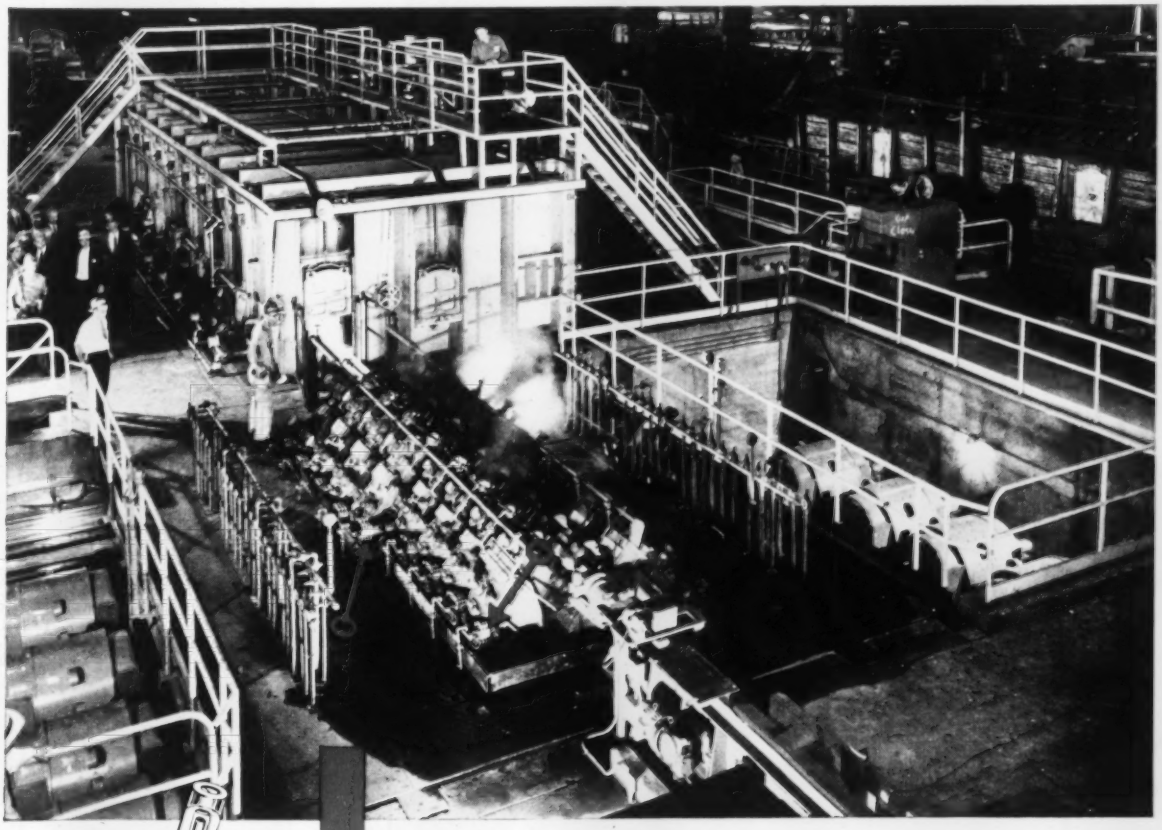


FARVAL
—Studies in
Centralized
Lubrication
No. 227

Farval protects bearings as tubing is reduced from 7 to 2 inches

ON this 16-stand Aetna-Standard tube stretch reducing mill, bearings take tremendous pressures as cherry red tubing is reduced from 7 to 2 inches in diameter. And lubricating those essential components is a Farval centralized system delivering measured amount of lubricant at set intervals to every bearing. These bearings are lubricated automatically and safely while the mill is actually in operation.

For bearing protection on your machinery, check with Farval for lubrication. For specifications and drawings, ask for Bulletin 26-S. Write The Farval Corporation, 3270 East 80th Street, Cleveland 4, Ohio.

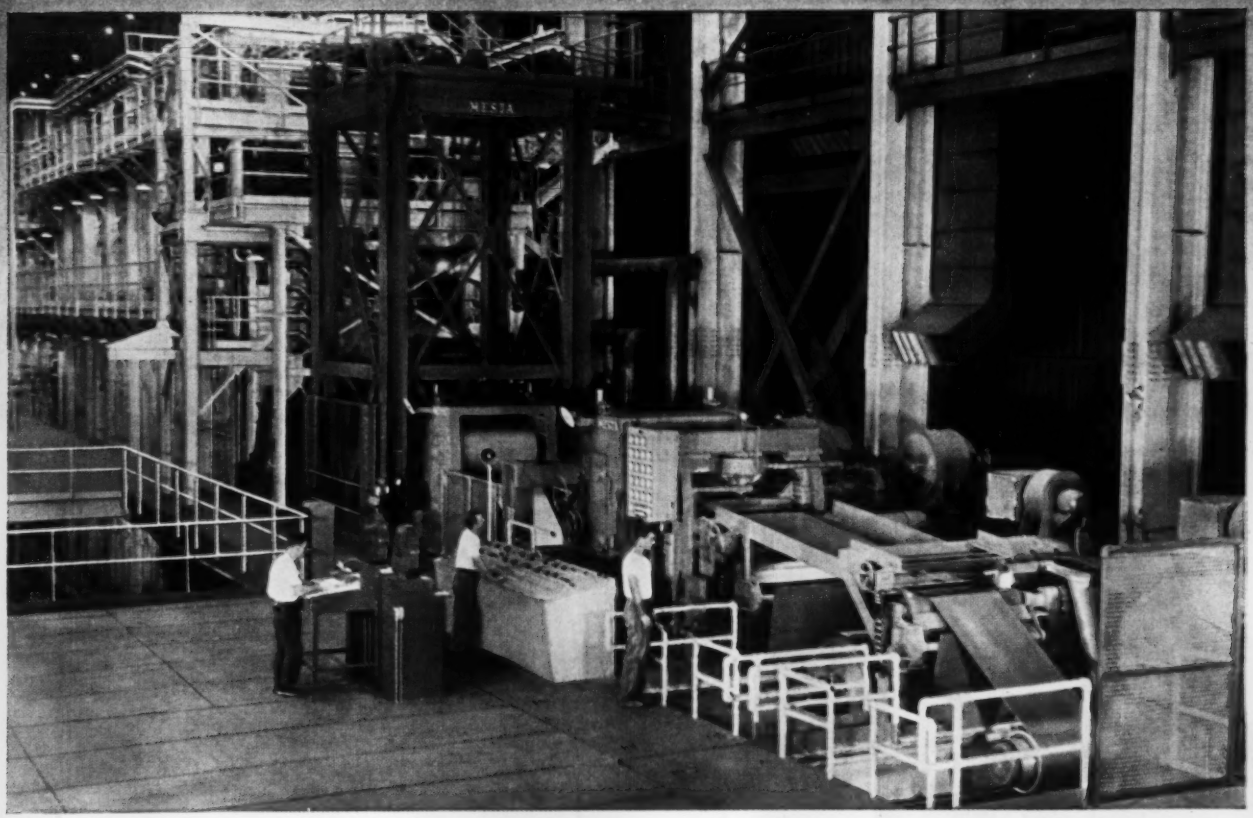
KEYS TO ADEQUATE LUBRICATION —wherever you see the sign of Farval—familiar valve manifolds, dual lubricant lines and central pumping station—you know a machine is being properly lubricated.

Affiliate of The Cleveland Worm & Gear Company. Industrial Worm Gearing. In Canada: Peacock Brothers Limited.

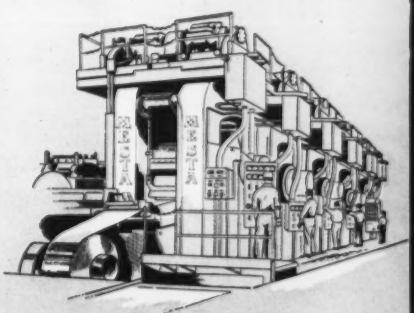
FARVAL
CENTRALIZED SYSTEMS OF LUBRICATION

CLEANING AND ANNEALING LINES

Designed and Built by MESTA



MESTA 2000 FPM Continuous Cleaning and Annealing Line for Steel Strip in Tin Plate Gauges with Pay-Off Reels, Mash Welder and Tension Reels in Operation at Weirton Steel Company, Division of National Steel Corporation.



Designers and Builders of Complete Steel Plants

MESTA MACHINE COMPANY

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